THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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# COMPUTERWORLD

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# Apple-DEC plot gels

*Firms to lay out framework for linking systems*

BY PATRICIA KEEFE
CW STAFF

BOSTON — Apple Computer, Inc. and Digital Equipment Corp. are expected to unveil today the underpinnings of a strategy for enabling users to easily swap files, access databases and utilize peripherals between both companies' network environments.

In briefings to analysts last week, DEC and Apple said they would provide third-party and corporate developers with a blueprint of plans first announced eight months ago. The two firms will outline a set of base services that include software specifications, application programming interfaces and utilities covering file, print and other basic protocols.

These developer's aids will serve as the foundation on which to build advanced applications such as Apple Macintosh-to-DEC VAX SQL services, according to one analyst.

Analysts said DEC and Apple will begin providing these base services 12 to 18 months from now. It will take at least four months for developers to write applications based on the services once they are released, an analyst said. The formal announcement will be made in front of an audience of 150 to 300 programmers before the Macworld Expo/Boston conference on Wednesday.

### Directions included

The integration tools represent a clear attempt by Apple to exert some control over the booming Apple-to-DEC communications market by providing a set of standard guidelines and tools. The Cupertino, Calif., workstation vendor has taken similar steps in the Apple-to-IBM market (see story page SR/6).

While products already exist that tie Appletalk to Decnet, the new specifications are expected

*Continued on page 84*

# Micro Channel tuned out

BY ALAN J. RYAN
CW STAFF

Users anticipating a flood of IBM Micro Channel Architecture-compatible computers by the end of this year should instead begin preparing for a drought.

Acceptance of MCA has been slower than originally anticipated by vendors that were ready to dive into the potential profit pool created through IBM technology. And users willing to move to the new bus architecture are likely to buy IBM until the clones are able to prove their worthiness and compatibility.

While overall sales have been slowly rising for IBM's MCA-based Personal System/2s, IBM is not likely to surpass its 1987 Personal Computer AT sales with MCA sales this year. Meanwhile, some PC-compatible vendors are laying low, content to let IBM drum up business for the MCA machines.

Dell Computer Corp., which was the first company to announce it was building a Micro

*Continued on page 85*

# Aging Univac system triggers O'Hare air jam

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — An 18-year-old radar-tracking system broke down last week at O'Hare International Airport, the world's busiest, leaving air-traffic controllers without electronic identification of aircraft and resorting to paper flight plans. The incident came just days after the Federal Aviation Administration awarded IBM a $3.6 billion contract for an advanced tracking system to be implemented in the 1990s.

In the incident here, a Univac-based tracking system, made by the former Sperry Corp. and first installed in the 1970s, came down while FAA technicians were trying to boost its capacity. The same tracking system is also used at 22 other major airports and at 39 smaller airports nationwide.

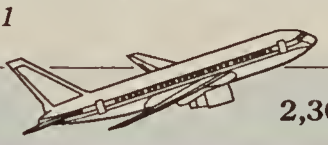
The breakdown in the Univac computer — the Automated Radar Terminal System III known as ARTS III — forced O'Hare controllers to rely on paper flight plans, radio messages and visual flight rules to manage more than 2,000 takeoffs and landings. It delayed nearly half the flight traffic at O'Hare Aug. 1, affecting a total of about 1,000 jets. Controllers used a backup plan that spaces planes seven miles apart instead of five, causing average delays of 20 to 30 minutes during the 12-hour period.

The O'Hare upgrade was part

*Continued on page 4*

**Attention passengers**

*A computer breakdown at O'Hare International Airport affected nearly half the day's flights on Aug. 1*

| | | |
|---|---|---|
| Number of landings and takeoffs from O'Hare |  | **2,300** |
| Number of aircraft delayed | | **1,000** |
| Normal spacing between planes | | **Less than five miles** |
| Spacing on Aug. 1 | | **More than seven miles** |
| Average delay on Aug. 1 | | **20 to 30 minutes** |

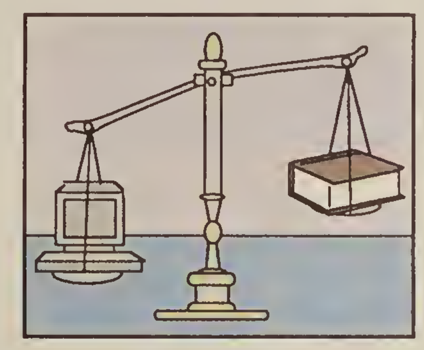
INFORMATION PROVIDED BY THE FEDERAL AVIATION ADMINISTRATION
CW CHART: FRANK C. O'CONNELL

# Loopholes, apathy open gates to hackers

BY J. A. SAVAGE
CW STAFF

Twenty four-year-old Marcus Hess would sit at his terminal in Hannover, West Germany, and read data from military, defense contractor and university computers all over the U.S. Hess was clever and careful. He gave himself system manager privileges and covered up his audit trail. For at least one year, he attempted access to hundreds of computers.

Little did Hess know he was being watched and his every command recorded. He finally got caught in a trap set by computer science researcher Clifford Stoll at Lawrence Berkeley Laboratory. Stoll tried desperately to get Hess caught and put out of business, but federal security agencies could hardly be bothered.



Hess was not prosecuted for the data invasion. And while his computer was seized, it was returned to him, with the data unexamined, by West German authorities.

This case is a textbook example of how laws governing computer crimes are few and vague and interest in enforcing them is modest.

"The mind-set of the investigators is that they don't want to investigate computer crime because they don't understand it," said Jim Christy, assistant chief of computer crime at the U.S. Air Force Office of Special Investigations in Washington, D.C. In the Hess case, "most investigators were looking for an out," Christy added.

According to Christy, excuses were readily

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NEWSPAPER

SECOND CLASS MAIL

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>
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>
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# Sun's Cooke latest chief to hang up warbonnet

BY JAMES CONNOLLY
CW STAFF

RADNOR, Pa. — Another well-known MIS director changed career paths last week. Sun Co.'s Dudley P. Cooke revealed plans to accept a voluntary early retirement package offered to Sun executives in the wake of corporate restructuring and a decision to spin off Sun's petroleum exploration and production groups.

Cooke, 56, said he will retire Dec. 1 with plans to establish a management consulting firm focusing on information systems. General manager of Sun's Information Systems Division for six years, Cooke has been active in MIS-related professional organizations such as the Society for Information Management and has participated in activities such as the Gartner Group Excellence in Technology Award Committee.

Cooke said Sun will not replace him and will eventually shift most of its 200 corporate MIS staffers to business groups. Sun offered executives early retirement in the wake of a July move to spin off most exploration and production, thus eliminating most corporate positions.

"We've built one of the best organizations in the business," Cooke said, describing the MIS group that he took over after 20 years at Sun and seven years at Exxon Corp. in a variety of management jobs involving corporate troubleshooting, finance, materials management, marketing and plant operations. One of his assignments was a six-week project in which he oversaw the spin-off of Sun's external data processing systems operation.

Reflecting on his current group's accomplishments, he noted, "We are doing more work than ever before with less staff." He said Sun had 1,111 systems employees when he started with the company and now has 520, even though systems use has grown 25% per year.

**Sun's Cooke**

Cooke, who said the progress made in communications technology has surprised him even more than the gains in computer technology, offered as advice to those seeking a top MIS position: "The biggest asset you can bring to the information systems side is to know the business. You have to be able to marry the available technology with what the business person needs."

# SQL Server to roll sans front wheel

BY STEPHEN JONES
CW STAFF

REDMOND, Wash.— It looks like the SQL Server database engine will roll off the assembly line this year as promised, but it is still unclear when a critical series of sporty front-end applications will make it to the showroom.

Users who have taken a first peek at SQL Server said the code is fairly clean and contains no major obstacles that would prevent the product from hitting its fourth-quarter shipment deadline. The technology for SQL Server was licensed by Microsoft Corp. from Sybase, Inc. Ashton-Tate Corp. joined the development effort last January.

The companies had originally indicated that the product might ship in the second half of this year, but a source close to Microsoft said that deadline has been narrowed down to the last quarter of the calendar year.

Microsoft is expected to start a widespread beta-test program by distributing early copies of the software to developers at Comdex/Fall '88 in November, sources close to the development effort said.

### Solo performance

While the code for SQL Server seems to be relatively free of bugs, the product could find itself without any front-end partners at the time it ships.

Ashton-Tate has made the biggest pledge to support SQL Server. The company is building a version of its Dbase IV that will act as a front-end database and use SQL Server as a powerful back-end database engine.

"SQL Server has a very good kernel, but there is a real need to develop good applications and development tools, and the good front ends are not out there yet," said one user who has examined a copy of SQL Server.

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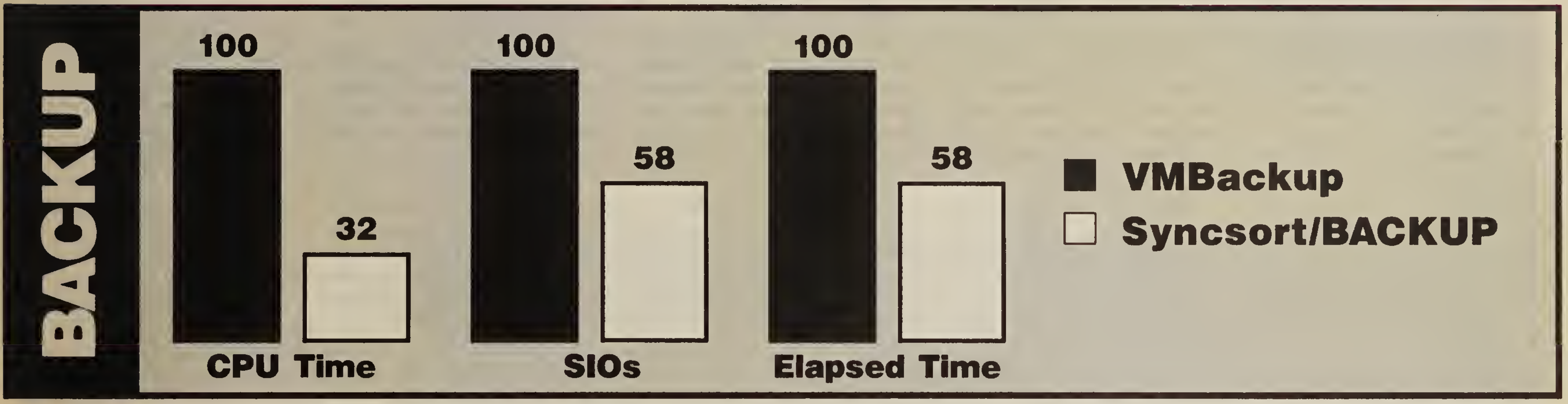

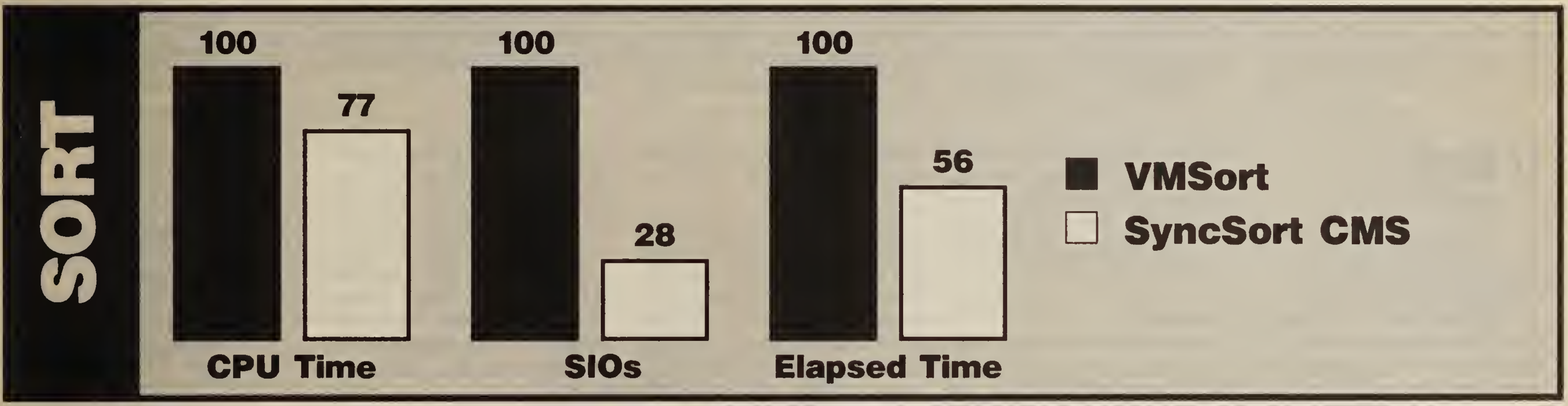

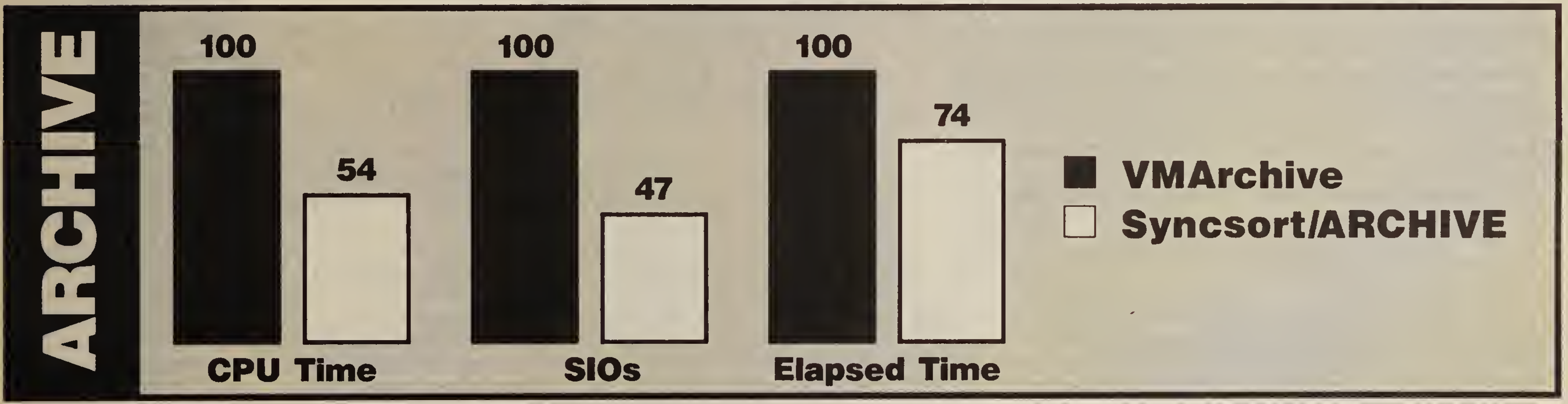

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# Flood system hopes to keep N.J. dry

BY ELISABETH HORWITT
CW STAFF

PARSIPPANY, N.J. — A computer network flood-warning system that designers hope will save lives and property was initiated here last week, although critics said the $1.1 million investment will offer little relief to the flood-ravaged Passaic River Basin unless local agencies are prepared to act on earlier warnings of disaster.

Considered one of the most flood-prone areas in the nation, the Passaic River Basin in northern New Jersey has lost an average of $84 million annually in property damage because of flooding. An April 1984 deluge cost four lives and $350 million in damages.

The warning system, reportedly the most advanced in the U.S., is expected to reduce annual property losses by more than $8 million. It will accomplish this by reducing from six to two hours the time it takes the National Weather Service to warn affected communities, according to the U.S. Army Corps of Engineers, which initiated and funded the project.

However, faster dissemination of warnings will only give local agencies "more time to drink coffee before the flood arrives" unless such organizations have implemented flood mitigation systems to respond to the information more quickly and effectively, said Clark Gilman, chief of floodplain management at the New Jersey Department of Environmental Protection.

"Right now, [the system] is the most expensive toy they've ever given me. Without that last link, we've wasted a lot of money," he said.

Communities also need to implement contingency plans so they can take effective action as soon as they know which areas are likely to be affected, said Sam Tosi, an Army Corps deputy district engineer who is also chief of planning for the flood warning project.

Designed by Sierra/Misco, Inc., a Berkeley, Calif., systems and software firm, the hub of the Passaic system is made up of Compaq Computer Corp. Deskpro 286 personal computers that reside in emergency management centers located in the four most flood-prone counties in northern New Jersey.

A network of 31 rain gauges throughout the basin collect rainfall and flood-level data and send it via UHF radio links to the Deskpro computers, which can then distribute the information to terminals at local agencies throughout the flood basin.

### Word travels

The data also travels by Contel Corp. ASC satellite links to Deskpro computers at National Weather Service offices in Trenton, N.J., Philadelphia and Harrisburg, Pa. The weather service analyzes the data and sends warnings, weather watches and bulletins not only to affected areas but also to pertinent downstream communities and offices such as the U.S. Geological Survey and the Department of Environmental Protection.

A Deskpro residing at the Morris County emergency office acts as a gateway between the four-county UHF network and the satellite links out to the weather service's Deskpros. To ensure that crucial information continues to flow even during violent storms, Sierra/Misco implemented a second Deskpro site as a backup gateway.

This set-up, which began limited operations in early June, got an unexpected test run when a recent lightning storm took out the primary Deskpro gateway.

As soon as the backup system stopped receiving transmissions from its counterpart over the UHF network, it took over operations — even before human operators realized a failure had occurred, Sierra/Misco said.

The system will cost approximately $1.1 million, with annual maintenance and operation costs of approximately $277,000. It could be incorporated into a $847 million flood-control project proposed by the Army Corps and currently being reviewed by Congress.

# O'Hare

FROM PAGE 1

of a year-long FAA effort to boost system capacity in all 62 ARTS III systems nationwide.

The trouble at O'Hare began just after midnight while FAA technicians were testing software that allows ARTS III to track more aircraft. After early-morning testing was complete, they had trouble restarting the older software.

"The technicians took the system down to load the new software program and to test it, but they never got the whole thing loaded," explained Stan Swallow, a spokesman at the FAA's aviation information division here. "It was essentially out all day." The ARTS III outage removed the identification labels from the radar scopes.

What followed was a morning with the usual complement of hundreds of arriving flights — except that O'Hare's radar scopes showed radar blips but no identification. "Traffic controllers could verify the flight's identification number [only] by asking the pilot to press a transponder button on the aircraft," said Teddy Burcham, air-traffic division manager at the FAA's Great Lakes region. Pushing the transponder button caused a bright symbol to appear next to an aircraft's radar image.

What went wrong? O'Hare technicians were frustrated by their inability to pinpoint a hardware failure that occurred during the overnight testing. When technicians determined that a faulty board was causing intermittent disruptions, it was taken off-line. Hours later, consultants were flown in to help solve the problem. It was not until 8 p.m., when traffic slowed again, that the malfunctioning board was identified and replaced.

### No choice

FAA officials said they have little choice but to continue enhancing the current ARTS III for the next five years — the time it will take IBM to develop and deploy the Advanced Automation System, or AAS [CW, Aug. 1]. Until then, the ARTS III will continue to guide all air traffic onto the nation's runways, FAA spokesmen said last week.

"The first new airport-tower computer complexes are scheduled for delivery in 1994," said Fred Farrar, an FAA spokesman in Washington, D.C. "We believe [the ARTS III computers] are going to be adequate in the meantime." Even so, O'Hare's changeover to the improved system software came late in the ARTS III upgrade project, Burcham said, adding, "O'Hare is not the place to be testing this kind of stuff."

The FAA has plans to build an interim hardware system to assist or replace the aging ARTS IIIs, Burcham said. Meanwhile, he said, the FAA plans to shift more of the radar-tracking work load to 20 regional FAA tracking centers. During the last year, these tracking centers have been outfitted with IBM 3083 computers. In the early 1990s, these IBM 3083s are to be replaced by the new generation of IBM AAS aircraft control systems.

Memory in the ARTS III multiprocessor units has been expanded greatly since their introduction, in part to deal with increased air traffic.

Built to defense-industry specifications, ARTS III computers are designed to be fault-tolerant. They can reroute messages through redundant circuits if necessary, the FAA said. The systems are maintained by the FAA, not by Univac successor Unisys Corp.

A source within Unisys who is familiar with the ARTS III equipment said the O'Hare breakdown was highly unusual and that similar upgrades had gone flawlessly at other airports.

In spite of that claim, a spokesman at the National Transportation Safety Board said last week that it was conducting an investigation of O'Hare and its aging control systems.

*Washington Bureau Chief Mitch Betts contributed to this report.*

## Grounded in the East

An overnight attempt to upgrade the air traffic control program at a Federal Aviation Administration regional tracking center in Nashua, N.H., early Friday disrupted East Coast flight operations for nearly three hours.

FAA technicians used an overnight shift to install a software upgrade to the center's IBM 3083 host computer. The upgraded National Air Space (NAS) software began delivering flight-path printouts to incorrect printers, said Dave Judson, an air traffic operations specialist at FAA regional headquarters in Burlington, Mass. "The identification tags on the radar screens were in the right places, but the flight-progress [paper] strips were going to the wrong printers in the center," he said.

The problem, recognized at 6:30 a.m., caused technicians to switch to the older Direct Access Radar Channel (DARC) backup system, Judson said. But using DARC meant that controllers had to revert to older, manual procedures to direct air traffic throughout eastern Canada, New England and parts of New York state, including Long Island.

At 6:45 a.m., the Nashua tracking center — called the Boston Center — began to hold planes on the ground in areas covered by adjacent centers, including Washington, D.C., New York and Cleveland. Controllers feared normal levels of incoming planes would overload the disabled system.

By 8 a.m., with DARC working and the IBM 3083 off-line, air traffic under the control of adjacent centers was restarted and spaced out. By 8:20 a.m., the Boston center's host IBM computer had been restarted with the original, unenhanced NAS software, and normal traffic conditions returned to the East Coast at 9:20 a.m.

JEAN S. BOZMAN

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# IBM service plan to cover non-IBM gear

BY STANLEY GIBSON
CW STAFF

RYE BROOK, N.Y. — Stretching its service umbrella to cover more of its customers, IBM said last week that it will provide one-stop maintenance for users who have non-IBM equipment in their shops.

The program was designed for users who want to hand over to IBM the burden of dealing with several maintenance vendors. Under the plan, called Technical Services Management, IBM will subcontract with other vendors for service and contact them when a problem occurs.

IBM has offered the service to some two dozen accounts on a test basis during the last six months, according to IBM National Service Division Vice-President John Patrick. Patrick said some of the pilot accounts were large IBM customers and others were small System/36 shops. The offering will be available to all shops regardless of size, he said.

"A lot of customers don't want to spend their time on service management," Patrick said. But, he added, "it's not for everybody," explaining that some customers prefer dealing directly with all maintenance providers.

The one-stop shopping concept is similar to a program that Digital Equipment Corp. instituted in 1983 and that third-party maintenance providers have put in place in the past several years.

> "AT THIS POINT, it is not practical to utilize IBM personnel to service every piece of non-IBM equipment."
>
> JOHN PATRICK
> IBM

Jim Paster, head of IBM sales at Control Data Corp.'s Engineering Services, said the IBM program is targeted mainly at larger accounts. He said CDC could gain by acting as a subcontractor to maintain non-IBM equipment. However, he conceded that CDC could also lose business if IBM tends to push other maintenance vendors out of its accounts.

"I see no added value for that for an account with any degree of sophistication," said Don Goodspeed, president of Computer Maintenance Consultant Ltd. in White Plains, N.Y.

Technical Services Management consists of the following three options:

- **Repair Coordination.** Under this program, a user calls IBM's 800 number for service and IBM dispatches the vendor or third party performing maintenance on the non-IBM equipment. IBM then manages the service process until the problem is resolved.
- **Maintenance Coordination.** This option gives IBM the "leadership role in ensuring a high level of systems availability for the customer," according to the IBM announcement. IBM coordinates predictive maintenance, tape and direct-access storage device maintenance and engineering and feature changes.
- **Services Management.** Under this option, IBM carries out contract negotiations, contract administration, invoice reconciliation and payments.

Patrick said Technical Services Management is an enhancement to the IBM Maintenance Agreement and is not offered separately. It carries standard pricing with no discount for customers signed up with IBM's Corporate Service Amendment.

Patrick said there is a scale of prices for the Repair and Maintenance Coordination options, depending on the different kinds of equipment covered. He said the Services Management option is to be negotiated according to each customer's needs. Patrick described the charges as "nominal."

However, IBM was unable to name prices for any of the services. An IBM spokeswoman said the scale of prices is not yet publicly available.

For the most part, IBM will not physically service non-IBM equipment but rather will call the vendor of that equipment or a third party. An exception will be made for minor peripheral equipment, such as paper feeders that attach to laser printers, Patrick said.

Equipment such as non-IBM personal computers and printers will be exchanged for working equipment rather than be physically repaired by IBM, Patrick said.

"At this point, it is not practical to utilize IBM personnel to service every piece of non-IBM equipment," he said. In principle, there is no reason that the company cannot service other equipment, he said.

Patrick said IBM will negotiate with service providers for non-IBM equipment but not for third-party service on IBM equipment, even at a customer's request.

"It's been a long time coming. Sorbus and others have been providing one-stop shopping. Now IBM will offer it. But it can't be as good as calling the maintenance vendor directly," said Joe Marion of William Marion Co. in Hackensack, N.J., an IBM mid-range leasing and maintenance firm.

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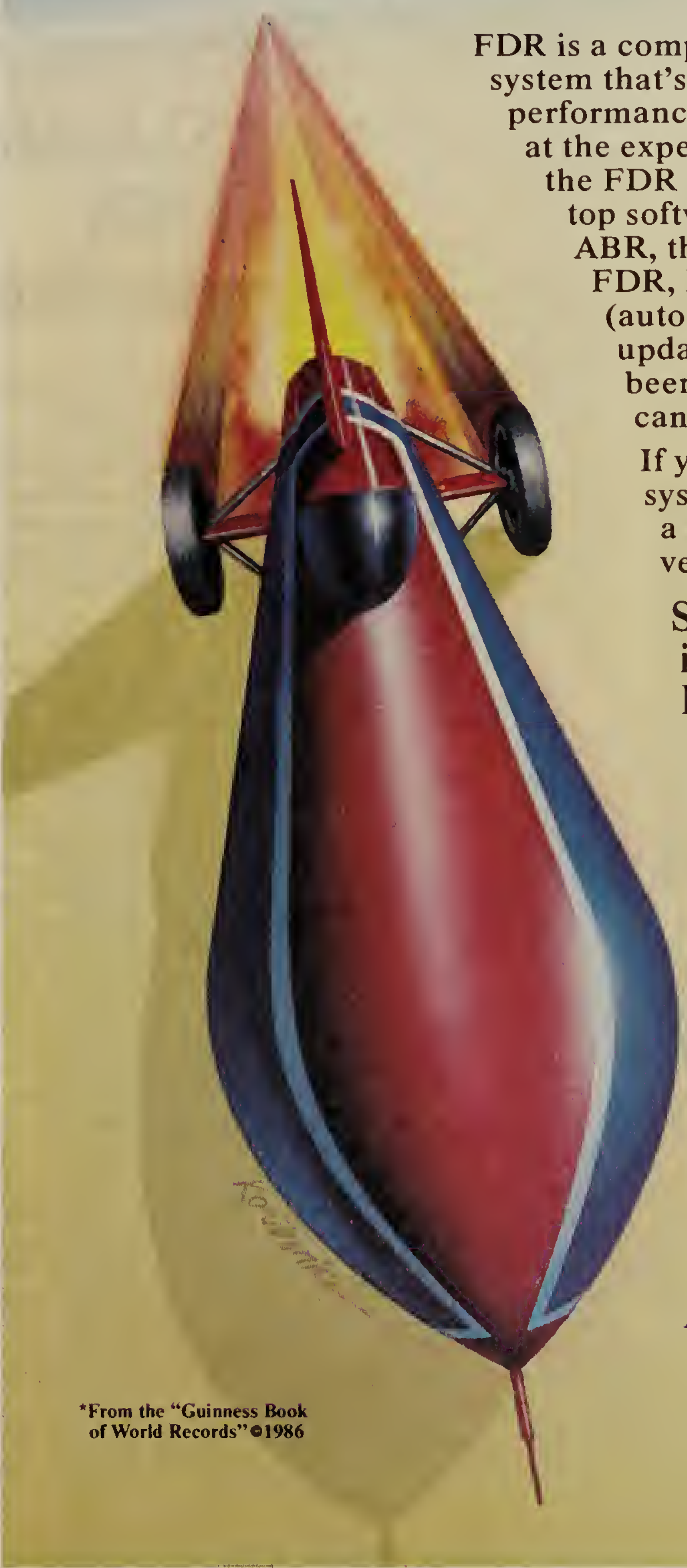

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# AS/400 draws IBM diehards

BY STANLEY GIBSON
CW STAFF

WEST HARTFORD, Conn. — Most customers who are planning to purchase IBM's Application System/400 are System/36 and 38 users in search of more power, according to a recently completed study by Focus Research Systems, Inc., located here.

Focus gleaned responses from 95 users who said they plan to buy one or more AS/400 systems. Most users said they plan to port their existing applications to the AS/400.

Because Focus sent a questionnaire to current computer systems users, the study does not deal with whether first-time computer users might be attracted to the AS/400. IBM has said it is aiming the system in large part at users with little computing sophistication.

Focus said the study revealed the following:

- In 81% of the cases, the AS/400 will replace an existing CPU.
- In 81% of the cases, the user did not consider another vendor or machine than the AS/400.
- Of the AS/400s on order, 87% will be programmed in RPG.
- Sixty-three percent of the AS/400s will perform financial and accounting tasks.
- Of all respondents, 68% are porting existing applications from another machine.
- Although 13.7% said they plan to complete the conversion in two to three days, 24.2% said they expect it to take more than 30 days.
- Seventy-seven percent of users with orders said they do not plan to add an additional AS/400 in the next 24 months.

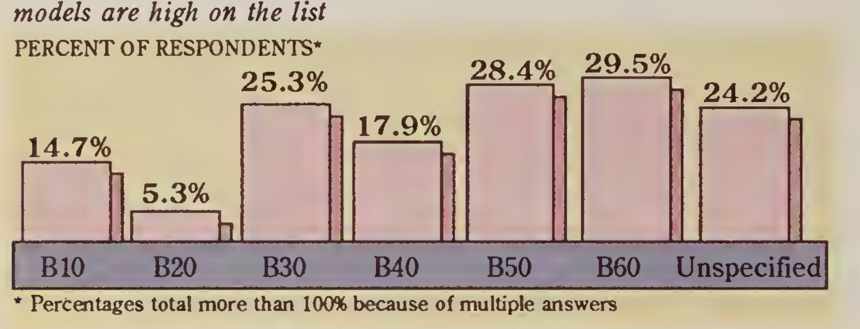
Consistent with the additional power requirement, the study showed users are gravitating toward more powerful rack-mounted versions — the AS/400 Models B30, B40, B50 and B60 — rather than the B10 and B20 pedestal models.

The conclusion that System/36 and 38 users who want more power will be the first to order the AS/400 is not surprising, according to Focus' Scott Brown. The System/36 and 38 had not had significant upgrades for two years; many users had been waiting for the AS/400 announcement and the additional power it would bring, he said.

Brown said users seem enthusiastic about the AS/400 — far more so than customers were for IBM's 9370 announcement. "We were able to find about 100 buyers in the first month after the [AS/400] announcement," he added.

**Heavy metal**

*Among 95 companies planning to buy the IBM AS/400, top-end models are high on the list*

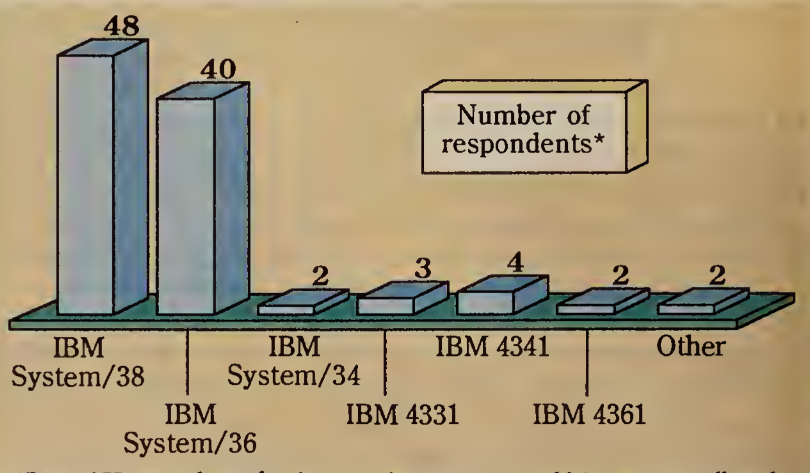


* Percentages total more than 100% because of multiple answers

INFORMATION PROVIDED BY FOCUS RESEARCH SYSTEMS, INC.
CW CHART

**Out with the old**

*IBM's System/38 tops the list of systems being replaced by AS/400 buyers*



*Base of 77 respondents planning to replace a system; multiple responses allowed

INFORMATION PROVIDED BY FOCUS RESEARCH SYSTEMS, INC.
CW CHART

# Masscomp buys Concurrent

## *Merged company to target top real-time slot*

BY NELL MARGOLIS
CW STAFF

BOSTON — With their stated target the No. 1 spot in the worldwide real-time computing market, Massachusetts Computer Corp. (Masscomp) and Concurrent Computer Corp. are joining forces to create a $350 million company armed with what both vendors claimed will be the broadest product line in the $4.8 billion niche.

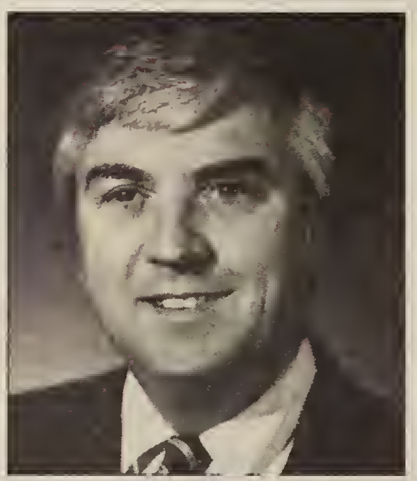
The merged company's arrival will also mark the departure of Norwalk, Conn.-based giant Perkin-Elmer Corp. — now the majority shareholder of Concurrent — from the computer industry.

Under an agreement already approved by the board of each company, Masscomp will purchase Tinton Falls, N.J.-based Concurrent's outstanding shares — 82% of which are held by Perkin-Elmer — for $20 a share, or a total of $230 million. Pending Securities and Exchange Commission approval and the successful completion of a $175 million debt-based financing, the deal is set to close by Oct. 1.

### Setting the staff

Concurrent President and Chief Executive Officer James K. Sims will become president, CEO and chairman of the combined company. Venture capitalist and Masscomp board member Russell Planitzer, acting president and CEO of Masscomp since the resignation of August Klein earlier this year, will remain on the board of the new firm.

While "it would be a little much to read in a tidal wave of [computer industry] mergers and acquisitions," said Jeffrey Canin, an analyst at San Francisco-based Hambrecht & Quist, Inc., "I see this as one of more such synergistic deals to come."



**Concurrent's Sims**

Under the agreement, several things happen:

- Masscomp gets critical mass. The smaller of the two companies, Masscomp had $75 million in 1987 sales and $6.3 million in 1987 profits after a $1.5 million loss in 1986, but the firm suffered a steep drop in net earnings in its most recently reported 1988 quarter. Concurrent reported more than 100% growth for the first nine months of its current fiscal year, as well as a 13% revenue jump to $201.9 million. Said Planitzer: "There's a tyranny of size in the computer business; you have to be at least a $400 million to $500 million company before you can do anything."
- Concurrent gets critical attributes — breadth and Unix, said Vicki Brown, an analyst at Framingham, Mass.-based International Data Corp. Beloved of the scientific and engineering market but inherently unsuited to real-time computing, Unix is a priority at Concurrent; it is a reality at Masscomp.

In addition, Masscomp's product lines, focused on the low-end and mid-range real-time markets, will fill in a gap in Concurrent's mid- to high-end offerings.

Commented IDC's Brown, "No customers of either company are going to be hurting because of this merger."

- Perkin-Elmer gets out. The company, which has already agreed to tender its 9.4 million Concurrent shares to Masscomp, has made no secret of its desire to exit the computer business and focus on semiconductor equipment and analytical instruments.

Notwithstanding the fact that Masscomp, much the smaller of the two companies, is technically the acquiring party, the entity that emerges from the merger will be called Concurrent Computer Corp. The choice of name seems inevitable: After the acquisition, there will not be much "Mass." in Masscomp. The new Concurrent will be headquartered at the current Concurrent's Tinton Falls home base.

Also, in order to gain maximum efficiency, Planitzer said, 220 of some 700 Masscomp jobs, largely in manufacturing, have been tagged for elimination. More cuts will follow when a task force now at work identifying pockets of inefficiency makes its report, Planitzer said.

# CSA loophole in IBM price hikes?

BY STANLEY GIBSON
CW STAFF

IBM may have unwittingly given users an easy out from its Corporate Service Amendment (CSA) as the result of a maintenance price hike announced quietly late last month.

In the low-key announcement, IBM raised maintenance costs on 3090 base and 3090 E models by 5%, effective Nov. 1. The same announcement boosted upgrade prices from 3090 base models to 3090 E models by amounts ranging from $75,000 to $225,000, effective Dec. 1.

The announcement was made concurrently with the rollout of the ES/3090 S models but was not included in the formal presentation or in materials given to the press or analysts.

It was also not mentioned in a general announcement of price increases made two days after the 3090 S rollout. That announcement boosted the price on many pieces of equipment by 5% and raised maintenance fees by 3%. At that time, IBM said all 3090 models were exempt from the price increase, not mentioning that maintenance on 3090 base and E models had been hiked two days earlier.

Together with maintenance price hikes made earlier this year, the increases could let some users withdraw from CSA without paying a penalty.

CSA, a discount program with contract terms up to five years long, specifies that should maintenance costs at a site rise by more than 3.5% in a year, a customer may withdraw from the program without notice or penalty. Otherwise, pulling out of the program without several months' notice entails a charge, generally a month's maintenance bill.

Donald Goodspeed, president of Computer Maintenance Consultant Ltd. in White Plains, N.Y., calculated that a client's maintenance bill jumped 3.95%.

The client's shop includes one 3084 and one 3090 Model 400 and a variety of disk drives, tapes and printers. Maintenance prices on 3084 CPUs were boosted by 7% early this year.

Responding to a *Computerworld* inquiry, IBM reiterated its policy allowing users to withdraw without penalty should maintenance prices exceed the CSA limit.

In another turn, an IBM spokesman said the 3080 mainframe line was excluded from the 3% maintenance price boost, even though that exclusion had not been spelled out in the price hike announcement.

Had those systems been hit with the 3% increase in addition to the earlier 7% boost, 3080 customers could also withdraw from CSA without penalty. The CSA withdrawal charge is waived if maintenance on a single piece of equipment rises by more than 7% in a year.

"It's so typical of IBM, when they announce a new product, to raise maintenance on older products," said a maintenance company executive who asked to remain anonymous.

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# NEWS SHORTS

## Thailand micro channel planned

A government and industry venture in Thailand plans to take on IBM Personal Computer clone makers by manufacturing machines compatible with IBM's Personal System/2 Models 50, 60 and 80. Tavorn Computer, well-known in Thailand for its microcomputer assembly work, is going into partnership with Nectec, the National Electronic and Computer Technology Center, which is a unit of the Thai Ministry of Science, Technology and Energy.

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## Slow-going for 10M Ethernet

Four months after a study group of the Institute of Electrical and Electronics Engineers, Inc. (IEEE) submitted a plan to develop a standard for 10M bit/sec. unshielded twisted-pair Ethernet 802.3 local-area networks, niggling details are still being hammered out. Group Chairwoman Pat Thaler said she hopes the plan developed by Hewlett-Packard Co., Synoptics Communications, Inc. and Wang Laboratories, Inc. can be polished enough to go on the ballot at the next IEEE meeting in November. But "that's a very aggressive target," Thaler confessed, adding that the next meeting after that will be in March.

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## Bell Atlantic LAN manager

Bell Atlantic Corp. said last week that it will add network management features to its central office-based LAN (CO-LAN) offering, beginning this fall. The industry's first CO-LAN management service will allow customers to assign and change passwords, remove and restore workstations and generate management reports, Bell Atlantic claimed.

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## DEC reaches out to developers

Digital Equipment Corp. will license the user interface of Decwindows to independent software suppliers to encourage development of applications that work with the DEC windowing program. Called XUI, for X User Interface, it offers a tool kit, window manager and user interface language for DEC's VMS and Ultrix operating systems. XUI is the part of Decwindows that DEC has offered to the Open Software Foundation (OSF) as the standard user interface for the OSF's version of Unix.

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## Oracle auditor missing

While Oracle Corp. acknowledged it had more than one auditor working on its benchmarks of Oracle with Transaction Processing Subsystem, announced July 18, it remains to be seen who the auditor was for its mainframe tests. Christopher M. P. Bird of the Gartner Group, Inc., who was pointed out as a possibile co-auditor with Tom Sawyer of Codd and Date Consulting Group, said it wasn't him. "We discussed the possibility," Bird said, but the Gartner Group declined after deciding benchmarking was not consistent with its research business.

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## Apple pulls even with IBM

For the first time in more than three years, IBM posted less than a 20% market share in sales through the computer specialty retail channel during the quarter ended May 1988, according to IMS America Ltd. Apple Computer, Inc. and IBM tied with a 19.1% market share, with Compaq Computer Corp. following with 11.6%. "This is the first time in a non-Christmas-selling season that Apple tied for market share with IBM into that channel," said Stephen Roberts, a senior marketing manager at IMS. For the quarter ended May 1987, Apple had a 17% share while IBM led the pack with 25.9% and Compaq pulled in third at 10%.

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## Lotus bailouts continue

Lotus Development Corp. lost two employees last week. Director of Sales Distribution and Planning John D. Shagoury jumped ship to join reseller Corporate Software, Inc. as vice-president of product marketing. Press pipeline Greg Jarboe will leave his post as head of corporate communications to rejoin the media. Jarboe will serve as head of media relations for a new computer publication.

# Users doubt sincerity of AT&T, OSF union

BY ROSEMARY HAMILTON
CW STAFF

Suspicion bubbled to the surface in the Unix market last week that the possible union of AT&T and the Open Software Foundation (OSF) could be a compromise in name only.

"I think it's all noise," said Marty Gruhn, vice-president of the Sierra Group, Inc., located in Tempe, Ariz. "Nothing of any benefit is going to come out of this waltz," Gruhn said of the negotiations.

Observers who were contacted last week said it would be difficult and time-consuming at best for both of the parties to work together toward a single Unix standard.

As a result, analysts questioned whether the real purpose behind the expected plan to unify the bickering factions is to end the negative publicity that has surrounded the Unix rivalry.

### In their best interest

AT&T and the OSF continued to send signals last week that they will join forces. In a speech before a Uniforum audience, Bill O'Shea, executive director of software systems at AT&T, stressed that it is in both parties' interests to work together on this issue.

"We are trying to reach an arrangement," O'Shea said. "If OSF is true to its principles and as long as they work within [the Unix] community, there's little chance for two Unix standards. I don't believe either of us can afford not to."

But neither side would explain how they will proceed once a deal is struck. Both parties said negotiations could be harmed if they publicly revealed any specifics.

"If they do actually compromise, it would have to be a substantial one, like one saying they'll support the other's version, and that's very unlikely," said Esther Dyson, editor of "Release 1.0," a newsletter published by Edventure Holdings, Inc.

**Inside**

- Posix enmeshed in political wrangle? Page 23.

However, users said that although they are not sure how sincere the compromise effort is, it is at least a step in the right direction.

### Better possibilities

"It seems there's more potential [for a single standard] if AT&T is part of OSF than if they're not part of it," said Dean Allen, vice-president of information and administrative services at Lockheed Corp.

Added Gary Handler, a vice-president at Shearson Lehman Hutton, Inc.: "I think anything that works to clarify the current situation would benefit the marketplace."

But analysts said it will be a tall order for AT&T and the OSF to establish common ground while keeping true to their existing commitments.

At the Uniforum/DC trade show last week, AT&T again stated its goal of delivering by next year Release 4, the merged Unix, that it said will blend its System 5 with Microsoft Corp.'s Xenix and Sun Microsystems, Inc.'s implementation, which is based on the University of California at Berkeley's version of Unix.

Meanwhile, the OSF remains committed to its plans to build on a yet-to-be-announced version of IBM's AIX.

### Not the bad guy

"What's really going on is AT&T is trying to change the fact that the OSF formation made them look like the bad guy," said David Fiedler, editor of "Unique," a Unix newsletter published by Infopro Systems, located in Rescue, Calif.

There was little agreement among analysts last week on what plans the OSF and AT&T could implement if they do decide to compromise with more than just words.

Claire Fleig, director of research at International Technology Group in Los Altos, Calif., said one option would be for the two to develop an interface that would link AT&T's Unix System V to what the OSF will eventually deliver.

But Dyson said an interface would make no sense. "It's sort of crazy to develop something else on top of what they're doing," she said.

Fiedler said the two could possibly reach a decision to use AT&T's Unix as a base on which AIX will sit.

"That way, AT&T can say its Unix is the kernel and IBM can say AIX is the porting base," Fiedler said. "That would be the most benign way of doing the whole thing."

# Apple to support Posix standard

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Apple Computer, Inc., trying to stay in the good graces of government buyers, said last week that future versions of its Unix-like A/UX operating system will comply with the pending IEEE Posix standard that has become so popular in the federal market.

In just the first quarter of this year, federal agencies issued 106 bid solicitations for Unix systems that can migrate to the Posix standard, said Phillip M. Dunkelberger, Apple's federal market manager, in an interview at Uniforum/DC.

Apple joined a growing list of industry heavyweights, namely IBM, Digital Equipment Corp., AT&T and the Open Software Foundation, that have said their forthcoming Unix versions will be Posix-compliant.

### Becoming a baseline

"The world is clearly converging on Posix as the baseline," said Bruce Weiner, president of Mindcraft, Inc., a Santa Clara, Calif.-based consulting and software testing company.

The National Bureau of Standards is expected to issue a federal Posix standard soon that will be a mandatory part of federal contracts unless a special waiver has been obtained.

The draft of an interim version was published April 29, and some vendors are already complying with it (see story page 23).

Posix defines a standard interface between the Unix operating system and applications software to foster applications portability at the source-code level [CW, March 16, 1987]. Eventually, Posix may become a complete standards-based computing environment.

Roger M. Cooper, head of information systems at the U.S. Department of the Treasury, said applications portability is important because the government's competitive procurement rules guarantee that agencies will have numerous brands of hardware.

Cooper, a featured speaker at Uniforum/DC, listed four major Unix procurements — at the U.S. Air Force and Army, the Treasury and the U.S. Department of Agriculture — that will total more than $6 billion when contracts are awarded.

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# Don't bet on OS/2 Extended — yet

BY DOUGLAS BARNEY
CW STAFF

It is the first major product written from the ground up for IBM and Microsoft Corp.'s OS/2 and the bedrock of IBM's Personal Computer software strategy. But so far almost nobody seems interested in buying the week-old IBM OS/2 Extended Edition.

"I haven't had anybody asking for it," said Carlos Frum, president of Northbrook Computers in Northbrook, Ill.

Then again, dealers are not going around praising sales of the base OS/2, either. Competitors are also not stealing IBM's thunder with sales of next-generation PC database management system products, most of which have yet to ship. In fact, the database and OS/2 wars have yet to begin.

## Stumbling blocks

Holding back OS/2 Extended Edition is the wait for the Presentation Manager interface and new local-area network support; a dearth of OS/2 Standard Edition sales; a lack of applications; and persistent confusion over OS/2 Extended's MIS role.

Added to these hurdles are the high cost of implementing the operating system that calls for a high-speed PC, nearly 6M bytes of expensive random-access memory and at least 30M bytes of hard-disk storage.

Despite the current lack of sales interest, a debate over the ultimate role of OS/2 Extended Edition rages. For International Data Corp. Vice-President William Zachmann, OS/2 Extended Edition is going nowhere fast. The reason? People are beginning to realize it is just not up to snuff with the rest of the industry, according to Zachmann.

The flat-file Q&A DBMS from Symantec Corp. can beat the pants off the database portion of OS/2 Extended, Zachmann said.

## Slow-burning fire

Others vehemently disagree and see the product as a slow but eventually highly successful burner. In fact, disparaging comments were also made about IBM's DB2 when it was introduced in the summer of 1986. The success of DB2 has since changed the face of the mainframe software industry.

"Critics don't understand the technology, the internal architecture. It has absolute compatibility with the mainframe [DB2] at the programming level, optimization, recovery and transaction control built in. Only a handful of products have that," said Rich Finkelstein, president of Performance Computing, Inc. in Chicago. Also tacked onto the base OS/2 operating system is a broad set of micro-to-host-oriented communications facilities such as the IBM 3270 and Digital Equipment Corp. VT terminal emulation.

IBM also views OS/2 Extended Edition as systems software rather than applications software. "It contains the basic building blocks. It is meant to provide an application platform," explained Pat Motola, OS/2 Extended Edition systems manager.

IBM has positioned OS/2 Extended as the PC cornerstone of its distributed database architecture, saying that DB2, SQL/DS and the Application System/400 DBMS will reach out from the top while OS/2 Extended will grow up from the bottom.

Many critics have focused on IBM's set of front-end tools, which analysts and some users have said are far weaker than competitive products. But what they may not see is the foundation upon which third parties can add an impressive array of tools. Borland International's Paradox, widely praised for its interface, is one such product.

In fact, OS/2 may live or die by the commitment of third parties, which has been scant. So far, many database and communications vendors have been rattling their sabres about competing against, not supporting, OS/2 Extended Edition.

## The wading pool

While analysts argue and vendors lay low, corporations have almost unanimously taken a wait-and-see attitude toward OS/2 Extended. They are waiting to see how good it is, how much support it gains and how it works with existing systems.

Charles Schwab & Co. is still wading through the more than 100-pound OS/2 Standard Edition development kit and has yet to give OS/2 Extended any scrutiny. Also, the firm's machines do not have enough memory for OS2 Extended, according to Bob Duste, manager of software engineering at the investment firm. In addition, "we don't have a hard driving need yet," Duste said.

"Wait and see" are also the words from Whirlpool Corp., which plans to buy a copy for evaluation. Even if Whirlpool is impressed, OS/2 Extended Edition would take time to implement. "It won't happen overnight or anywhere near overnight," said Robert Metz, a senior technical analyst at Whirlpool.

Like betting on a Super Bowl that is three years away, the OS/2 Extended game is simply too early to call.

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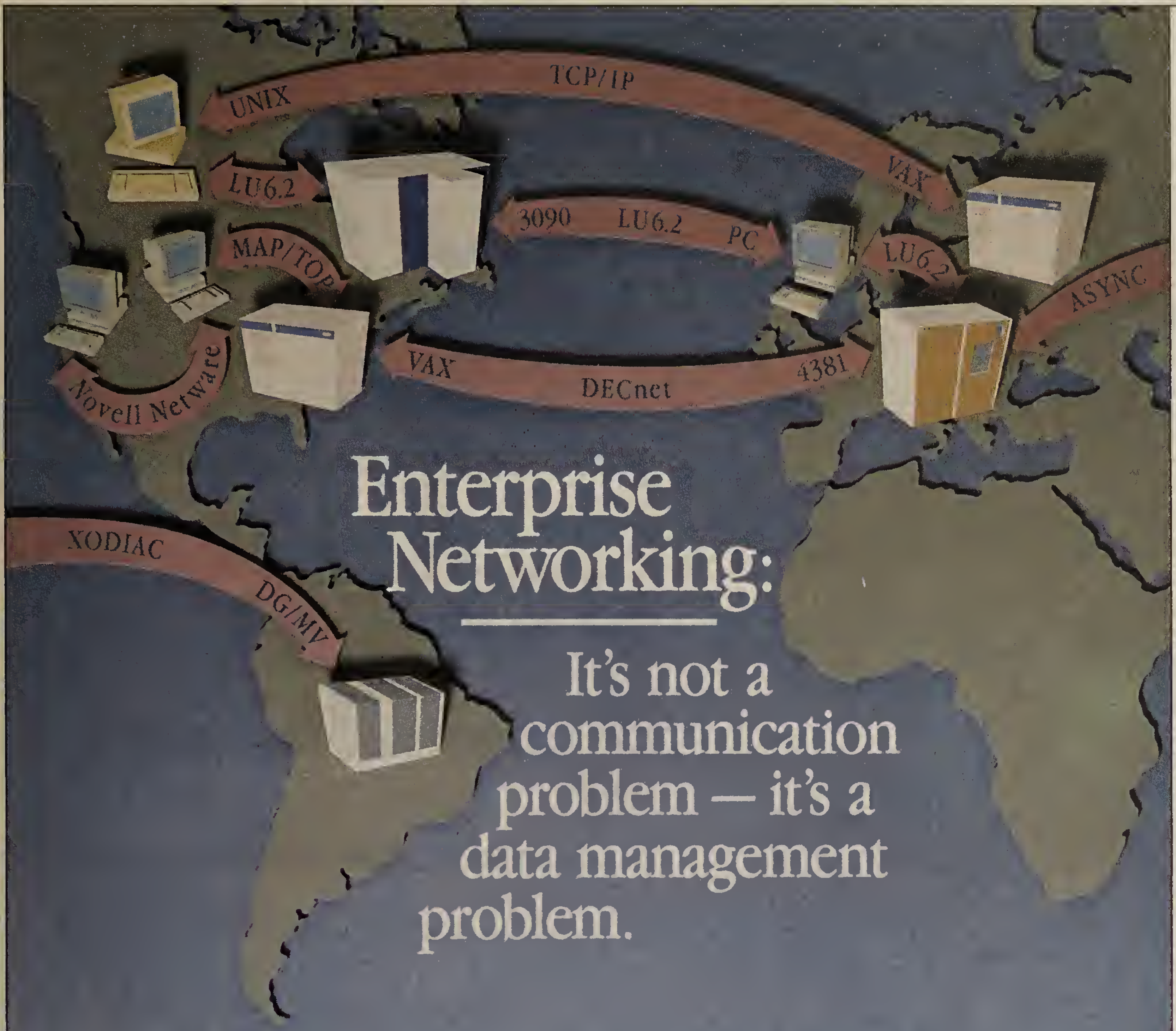

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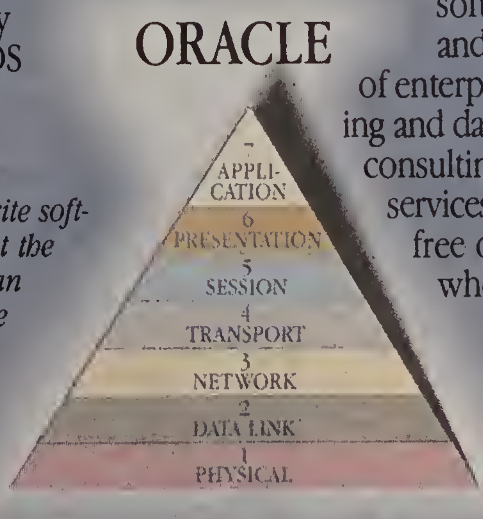

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| CA | Costa Mesa | Sep 1, Oct 4, Nov 11 |
| | Los Angeles | Sep 15, Oct 18, Nov 15 |
| | Oakland | Oct 6 |
| | Sacramento | Sep 22, Nov 10 |
| | San Diego | Sep 8, Oct 6, Nov 3 |
| | San Francisco | Sep 14, Oct 11, Nov 9 |
| | San Jose | Sep 20, Oct 26, Nov 17 |
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| | Stamford | Nov 15 |
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| ID | Boise | Oct 5 |
| IL | Chicago | Sep 15, Oct 11, Nov 16 |
| | Springfield | Sep 14, Nov 9 |
| IN | Indianapolis | Oct 13, Nov 17 |
| KS | Wichita | Sep 13 |
| KY | Lexington | Sep 14 |
| | Louisville | Oct 12 |
| LA | New Orleans | Oct 28 |
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| | Burlington | Nov 18 |
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| MI | Detroit | Sep 13, Oct 4, Nov 8 |
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| NJ | Iselin | Sep 15, Oct 13, Nov 17 |
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| | Rochester | Sep 14, Nov 2 |
| OH | Akron | Sep 20 |
| | Cincinnati | Sep 15 |
| | Cleveland | Oct 19 |
| | Columbus | Sep 22 |
| OK | Oklahoma City | Sep 13 |
| | Tulsa | Oct 25 |
| OR | Portland | Sep 8, Nov 15 |
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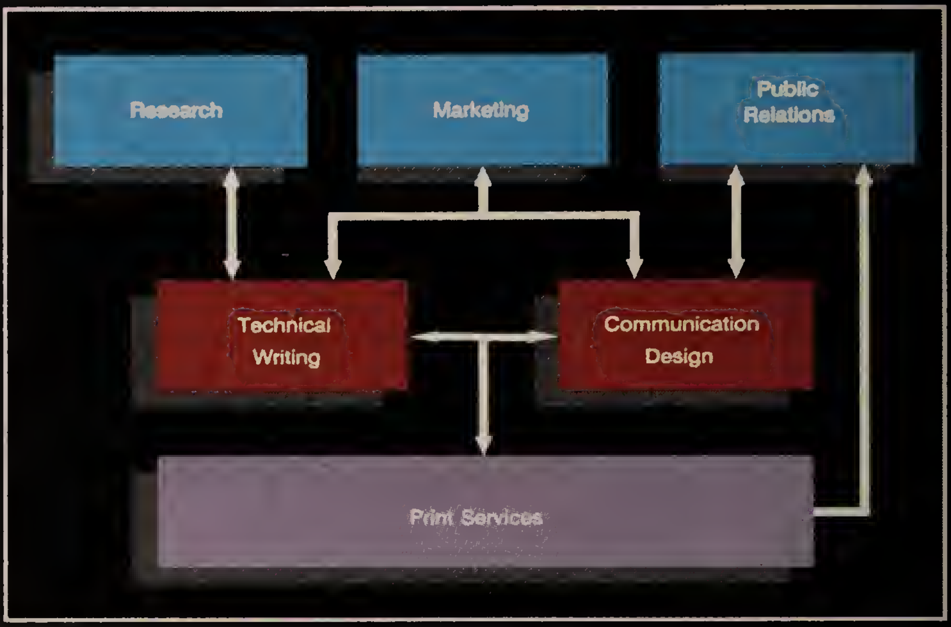

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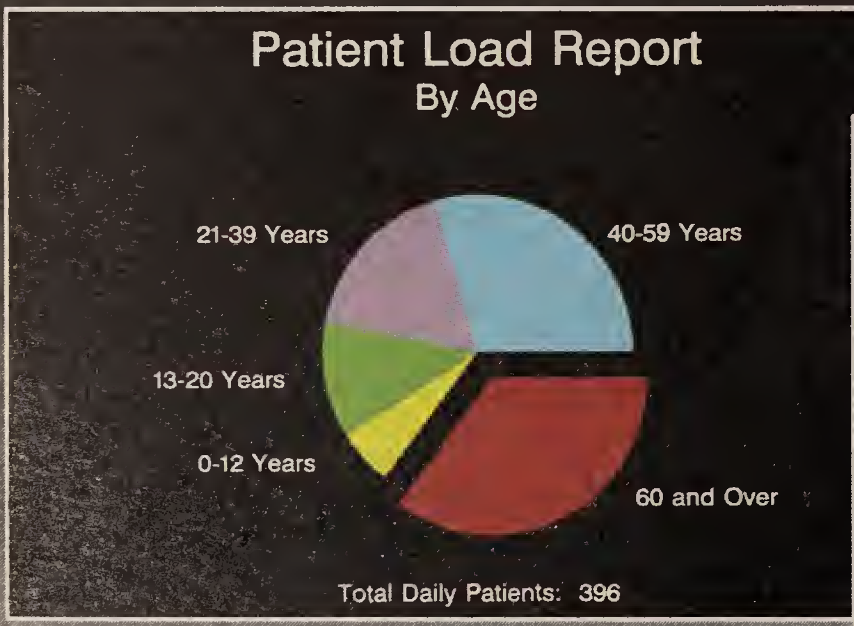

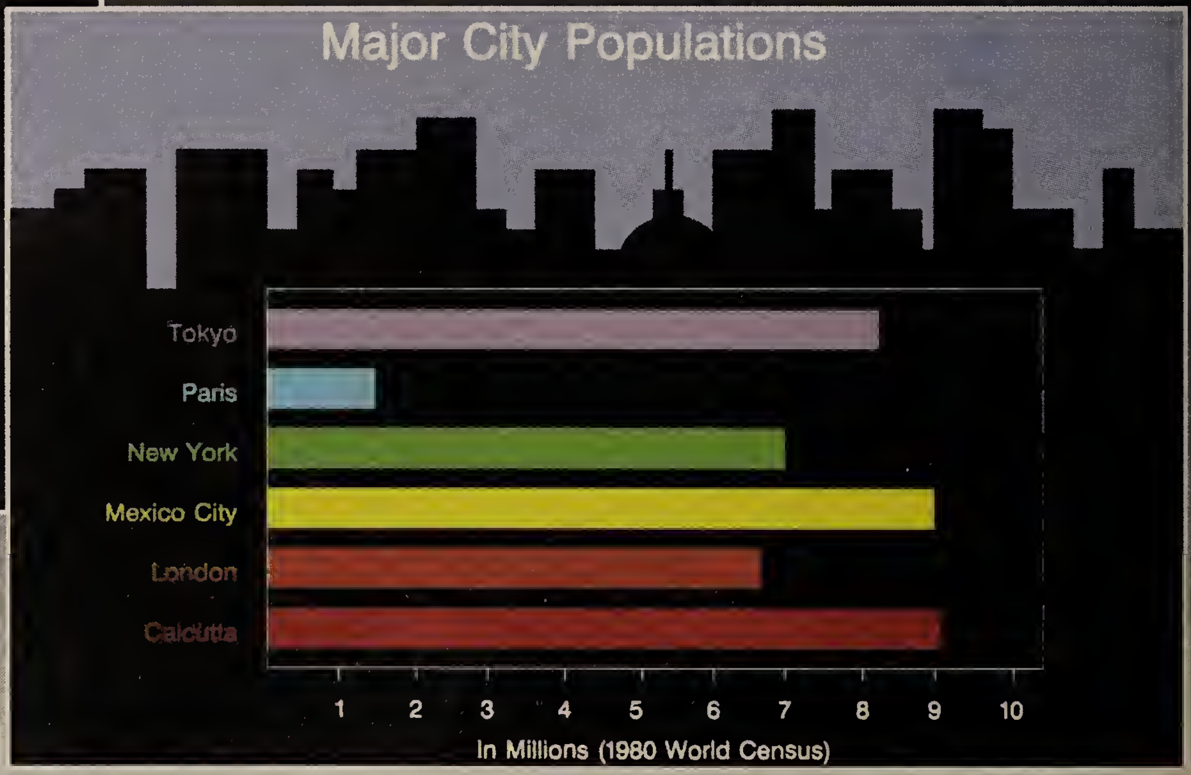

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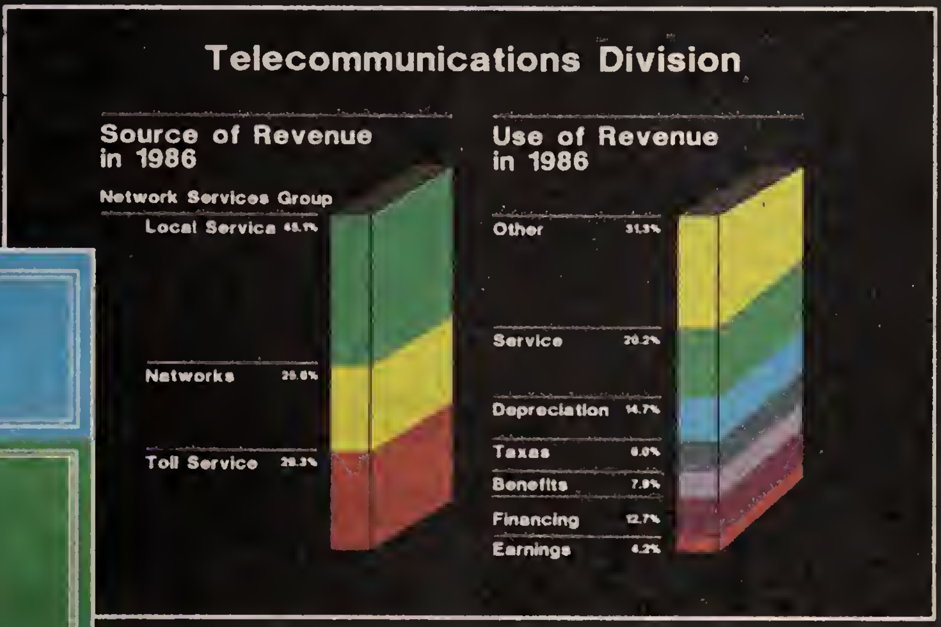

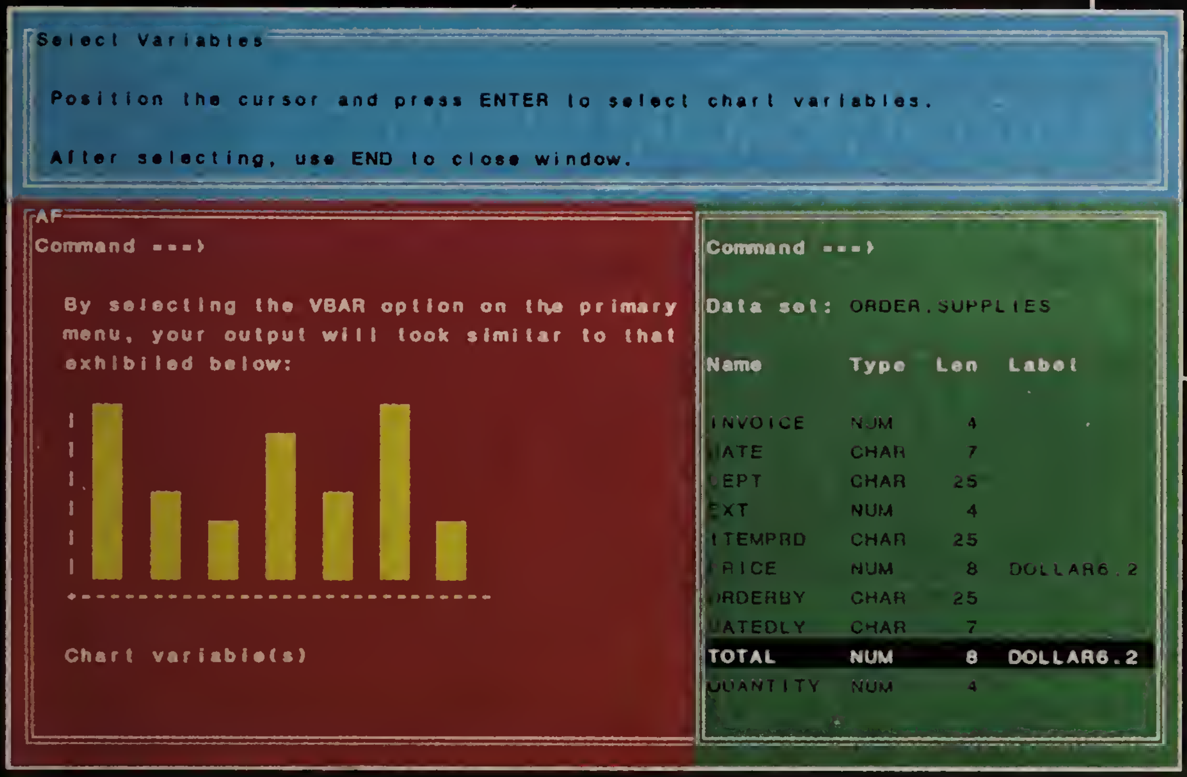

```
Select Variables

Position the cursor and press ENTER to select chart variables.

After selecting, use END to close window.
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AF
Command ===>

By selecting the VBAR option on the primary
menu, your output will look similar to that
exhibited below:

Chart variable(s)
```

```
Command ===>

Data set: ORDER.SUPPLIES

Name       Type   Len  Label

INVOICE    NUM      4
ATE        CHAR     7
EPT        CHAR    25
XT         NUM      4
ITEMPRD    CHAR    25
RICE       NUM      8  DOLLAR6.2
RDERBY     CHAR    25
ATEDLY     CHAR     7
TOTAL      NUM      8  DOLLAR6.2
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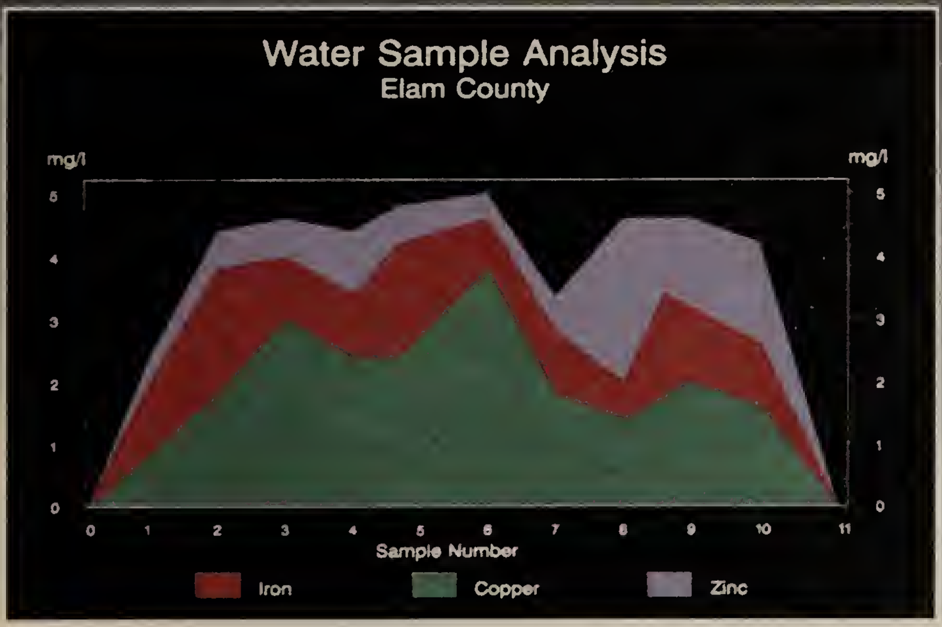

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# Trade bill tickles high-tech fancy

*Industry giants support omnibus, but sanction clause worries some*

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The 1,000-page trade bill passed by the U.S. Senate last week modernizes U.S. trade laws with provisions aimed at helping the computer and communications industries sell more products abroad and protect their copyrights and patents.

Companies on record as supporting the omnibus trade bill include IBM, AT&T, Digital Equipment Corp., Intel Corp. and NCR Corp., as well as trade associations, such as ADAPSO, that represent the software industry.

However, A. G. W. "Jack" Biddle, president of the Computer & Communications Industry Association, said he is concerned about a time bomb within the bill: mandatory U.S. sanctions against foreign firms that violate export controls in the future. Biddle said he is worried that harsh treatment of foreign companies will spur retaliation against U.S. exporters and that it "could destroy high-tech trade."

### Key provisions

Industry lobbyists said they are pleased with three other provisions in the bill:

- The bill relaxes export controls for many widely available high-tech products, such as personal computers, when the destination is Japan or Europe. The number of export licenses will be cut roughly 40%, and the U.S. Department of Defense role in reviewing the licenses will be limited to national security concerns.
- The president must negotiate for greater U.S. access to foreign telecommunications markets. If the talks fail, then the president must impose trade sanctions.
- The president is required to retaliate against countries that fail to protect U.S. copyrights and patents. Also, companies no longer have to prove economic injury for the government to block pirated imports.

### Changes lauded

Oliver R. Smoot, executive vice-president of the Computer and Business Equipment Manufacturers Association, praised Congress for making the technical changes in U.S. trade policy.

"We think it points the way toward a different attitude toward export controls, indicates a willingness to get serious about imports that infringe on our intellectual property rights and gives high priority to negotiating the removal of trade barriers in telecommunications," Smoot said.

The Senate passed the bill by an 85-11 vote, following approval by the House of Representatives last month. President Reagan, who vetoed an earlier version, is expected to sign this bill into law soon.

The trade bill has a variety of little-known provisions that may affect the computer industry, including the creation of a 12-member advisory group called the Competitiveness Policy Council and the transformation of the National Bureau of Standards into the National Institute of Standards and Technology.

Furthermore, buried in the bill are sections creating computerized job banks in all 50 states; the National Commission on Superconductivity; a federal database of trade statistics; the National Advisory Committee on Semiconductors; and the Clearinghouse on State and Local Initiatives on Productivity, Technology and Innovation.

In addition to addressing foreign trade, the bill "is a step toward addressing our competitiveness problems here at home," with provisions to boost research on advanced manufacturing technologies and improve education and training programs, Sen. Jeff Bingaman (D-N.M.) said.

The next generation of desktop computing will let us merge data from different sources into a useful flow of information.

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# HP face-lift leaves blemishes

BY JAMES A. MARTIN
CW STAFF

ORLANDO, Fla. — The more than 2,500 Hewlett-Packard Co. customers expected to converge here this week for the Interex users conference will find a company that has come a long way in the year since it shipped its long-delayed reduced instruction set computing (RISC) systems. Yet despite advances in technology, marketing and corporate stature since the 1987 conference, HP still faces formidable obstacles in its quest to challenge IBM and Digital Equipment Corp. in the minicomputer market.

Interex is expected to be a "state-of-the-state" show, with updates on HP's RISC-based Precision Architecture (PA) systems, the countersuit against Apple Computer, Inc. over New Wave and performance benchmarks from beta-test sites for the enhanced PA operating system, MPE XL Version 1.1.

But the company will probably downplay some holes that users and analysts still see in its product line:

- A lack of relational database and transaction processing capabilities on the HP 3000 Series 900, which make up the PA, or Spectrum, models. "HP is still playing catch-up with their software, and most users today are conditioned to having transaction processing and relational databases," said John Dean, a technology analyst at Montgomery Securities in San Francisco.
- A lack of new applications, both commercially and privately developed, for the Spectrum series. "Are HP's customers writing new applications for Precision Architecture, or are they just running the old applications on these higher performance, newer systems? That's the critical question," said Adam Cuhney, a technology analyst at Kidder, Peabody & Co.
- A lack of New Wave applications. Granted, HP's personal computer office automation environment was only recently placed in developers' hands and has become the target of a lawsuit by Apple. Nonetheless, it is imperative that HP build strong support for New Wave from independent software vendors. Currently, the most visible application announced for porting to New Wave is Microsoft Corp.'s Excel spreadsheet.
- A lack of support and interest in the HP 1000 real-time processors. Several users interviewed said they have been dismayed to see HP turn its attention away from the older HP 1000 systems in favor of Spectrum and the Unix-based HP 9000 workstations.

## Support weakening

"The level of support for the 1000 seems to be decreasing at an amazing rate," said Donald A. Wright, president of Interactive Computer Technology in Lake Elmo, Minn., and an Interex board member. "HP tells us it's time to migrate. What we say is, we will continue to migrate those applications that are appropriate, but the RTE operating system on the 1000 can do the job so much better on some things, so we don't want to migrate completely."

The HP 1000, once the firm's flagship minicomputer, has been repositioned as a real-time I/O application system, "which is really its strength," said Carmen Marchionni, technical systems marketing manager at HP's Technical Computer Group in Sunnyvale, Calif. Although the HP 1000 is not receiving any general-purpose computing enhancements and the last hardware upgrade was in 1984, Marchionni said Versions 5.1 and 6.0 of RTE, the HP 1000 operating system, are in development.

Overall, however, HP observers and customers are upbeat about the Palo Alto, Calif.-based company. The company's vigorous embrace of standards has gained the firm much respect in the industry. Its RISC technology has been well received by customers and Wall Street alike.

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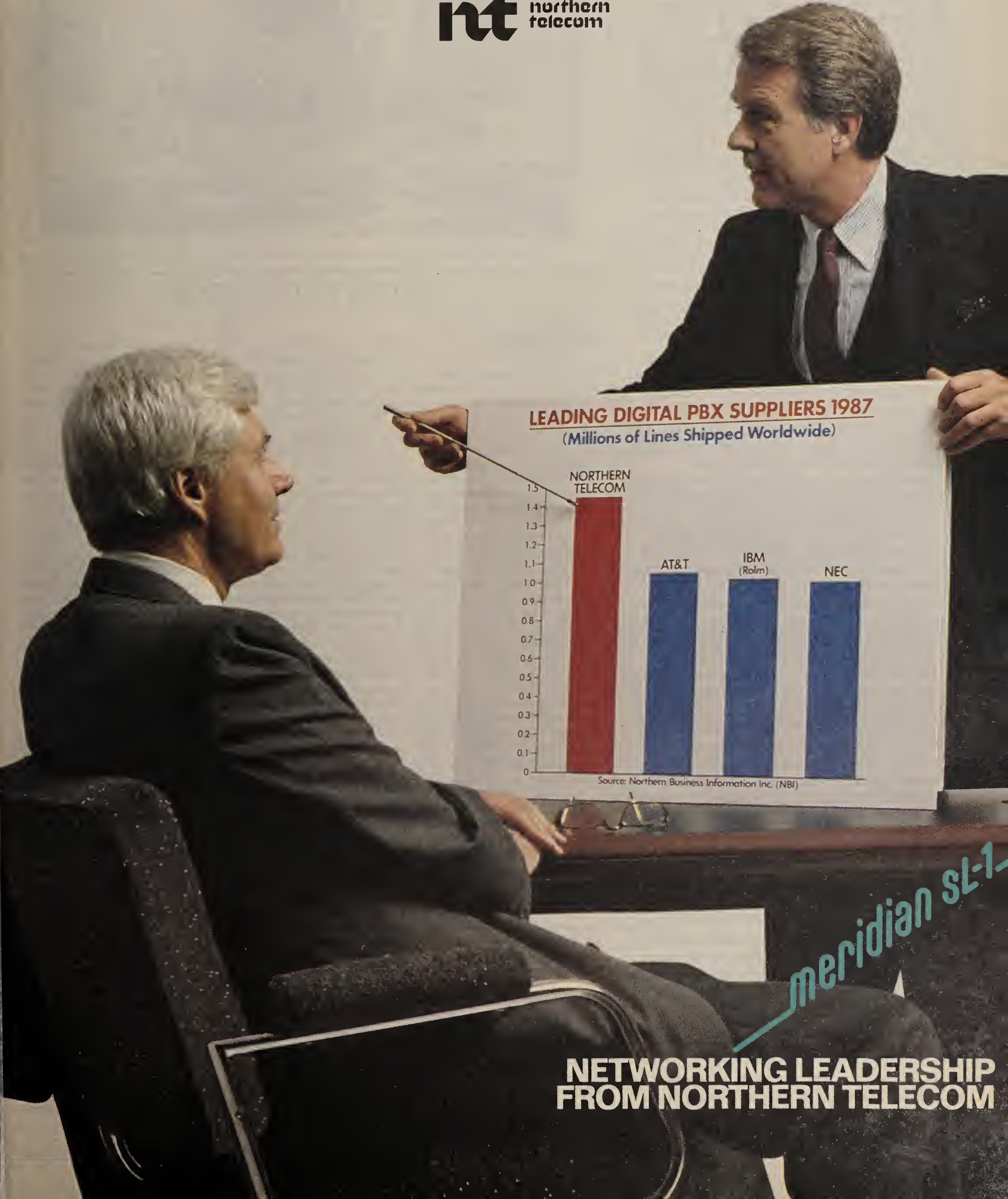

## EDITORIAL

# Miles to go

THE MIRACLE OF Apple's comeback from near-washout to industry superstar has been told to death, but will the magic continue to work in the MIS market?

As this week's Special Report on the Macintosh attests, Apple may still face its greatest challenge in gaining acceptance for the Macintosh as the machine of preference for corporate microcomputing. The distinction between preference and standard is important. The Mac is already an accepted option at many large firms, but it is still far from fulfilling a role as *the* machine for corporate microcomputing.

A telling statistic for Apple is the Mac's performance in a new survey of 174 MIS executives who are members of *Computerworld*'s Editorial Review Board. Although 37% of the members have Macintoshes installed at their sites, only 29% said they plan to purchase Macintoshes during the next 12 months. More troubling for Apple, 54% said the emergence of graphic interface programs for the personal computer will probably cause them to purchase *fewer* Macintoshes.

The Mac's success to date has been a function of the markets it created. The hugely successful desktop publishing craze has led many publications, including this one, to standardize on the Mac for virtually all presentation graphics.

But as a tool for day-to-day business applications such as word processing, spreadsheets and electronic mail, the Mac's only real edge is its ease of learning. That's not a small advantage, but against a base of 17 million DOS-based machines, it's also not a compelling argument for MIS to make it a front-runner.

To realize its potential as a favorite in MIS, Apple must move forward on several fronts. It must rapidly rectify its communications shortcomings with IBM hosts, particularly in the areas of Token-Ring support, Netview compatibility and cooperative application processing.

Apple must also get the flow of innovative new products started again. It has delivered no new computers since the Mac II shipped early this year. In a business in which one company controls and dictates all innovation within the hardware standard, inactivity is weakness. Advancing the state of the art is the answer. Suing Microsoft isn't.

Finally, Apple needs to better establish itself as a business partner for MIS. The company has made great progress in this area in the last year, but the alliance is still rough around the edges. On the one hand, Apple officials say they have corporate religion. But they also endorse a strategy of working their way into those corporations department by department. MIS was blindsided by that approach five years ago with the PC. It isn't likely to repeat the same mistake.

This is a time of opportunity for Apple. MIS buyers are unimpressed so far with IBM's Micro Channel Architecture. They are open to alternatives. With just a little more attentiveness to their needs, Apple can be that machine of preference.

## LETTERS TO THE EDITOR

### Just goods

Dynamic random-access memory chips in short supply? Suppliers afraid to ramp up production only to find a falling market? Inequitable distribution of available supplies among large and small customers?

Double and triple ordering to ensure adequate supplies distorting bill-to-book ratios? All these problems were solved years ago in agriculture and mining with commodity futures.

Megabytes of computer memory are as much an information age commodity as steel, oil and copper are to basic manufacturing.

Electronic chips are no more highly manufactured than gasoline, refined metals and frozen orange juice concentrate. Shouldn't commodity electronic future contracts be available to minimize these periodic panics and provide an orderly market for suppliers and their customers?

*Richard L. Kleir*
*Computer Systems*
*Berkeley, Calif.*

### Consultants OK

The article "Contract work: Risk vs. reward" [CW, June 20] was accurate and informative in pointing out some of the inherent dangers that go along with maintaining independent contractor status in the computer field.

The author was correct in pointing out that many "opportunities for technical professionals to take on their own contracting jobs without assuming the risk or overhead of running a business" were eliminated by Section 1706. However, the author indicated that "for those willing to face that risk, to keep books and sell clients on their services, it is still possible to work" as an independent programmer or consultant.

The fact of the matter is, most independent contractors take great pride in operating their businesses as any other company does. Independents pay more than the average employed worker in taxes each year.

And we are responsible for keeping accurate records and logs for all our consulting-related activities throughout the entire year. This is not something new for the consulting profession — it has always been the status quo.

In light of the controversy surrounding Section 1706, many of the larger technical service firms have chosen to capitalize on the erroneous fact that we are shoddy, unorganized and "tax cheats" who are protected by the notion that we have a legitimate business.

It is the conveyance of information in this manner that adds to that controversy and must not be tolerated.

*George R. Zita*
*President*
*Datamatic Information Systems, Inc.*
*Kearny, N.J.*

### Who's bad?

In "Morals over $$$" [CW, June 20], you editorialized about sanctions against South Africa. You made the doubtful statement that boycotts work and in general assumed that boycotting South Africa is a moral action. But that in itself is doubtful. What exactly are we against in South Africa?

Are we against repressive government? In that case, we have many far worse cases than South Africa to think about, including several close neighbors of South Africa.

For as long as Angola and Mozambique suffer Marxist dictatorship, we should boycott those countries rather than South Africa.

The movement to boycott South Africa is ignorant, thoughtless or hypocritical.

*John A. Wills*
*Administrative Computing Center*
*Pasadena, Calif.*

### This week in history

Aug. 7, 1978
Digital Equipment Corp. opens its first retail store located in the Mall of New Hampshire, promising immediate off-the-shelf delivery of small business systems, word processing systems and supplies.

Aug. 8, 1983
It's all systems go for the historic breakup of the Bell system as AT&T accepts the changes in its reorganization plan demanded by U.S. Federal District Judge Harold Greene.

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Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

# Computers still silent partners in high-tech

*Don't expect to chat with machines for a while*

AMY WOHL

Expectations are a funny thing. When we see something new and exciting, our reaction is not to the newness or the excitement of the thing itself but to how this novelty compares with what we already know.

Many of the newest technologies relate to what computers see and hear and how they understand and respond. Our expectations here are very high, for they have been set not logically — by earlier and cruder versions of similar technologies — but rather by years of books and magazines, television and movies.

Sometimes the popular media speculates on a far-off future, but often it pictures that distant horizon as nearly or entirely within our present vision.

Remember HAL, the human-sounding computer in *2001: A Space Odyssey*? It not only understood everything it heard and replied in an engagingly human way, but it could also spy on you and even read lips when it suspected your intentions.

And all the human-looking, human-seeming robot characters that appear on TV and in the movies — they hear, they speak, they even seem to have emotions.

No wonder the latest voice recognition device or image scanner seems so mundane. Our unreasonable expectations bump into everyday reality.

**Reality's not enough**

Devices today can record voice in compressed and digital form. This capability permits it to be stored and forwarded, as in voice mail, or attached to text or data files, as in voice annotation.

A limited-vocabulary speaker-specific device can be built, and it would be adequate for commanding a device or program or for requesting information from a database, for example. The technology does not yet permit large-vocabulary continuous-speech applications such as the infamous talking (listening, really) typewriter that accepts dictation and accurately displays it on the screen of a computer.

Users are not satisfied with the devices created so far, except in very specific applications such as inventory control. We have watched HAL understand our most subtle emotions and reply to them. We can't help, even if subconsciously, expecting a computer to act just like that.

There are still significant barriers to be breached:

- **Continuous speech.** Being able to understand speech as it is ordinarily uttered, in phrases, sentences and paragraphs rather than individual words.
- **Unlimited vocabulary.** Understanding all of English (or French or German) rather than only a few hundred or few thousand words.
- **Natural language processing.** Being able to speak in ordinary English and have the system completely understand it. This ability is not just voice recognition but the ability to understand the meanings of words and their relationships through grammar.

USERS ARE not satisfied with the devices created so far, except in very specific applications such as inventory control.

In a language like English, which permits many unique constructions and exceptions, this ability is particularly difficult. Never mind all the "natural language" interfaces you keep seeing: They are simply products that understand a few English words. "English-like" would be a better, but less exciting, description of their capabilities.

- **Speaker independence.** Being able to understand any speaker without being trained to understand specific speech eccentricities. Better yet, being able to understand many speakers in the interruptive and confusing manner in which human discussions usually occur.
- **Real-time response.** HAL replies immediately. Computers could understand more difficult questions if they had more time to consider (that is, process) them. But we demand real-time processing and immediate response.

There are other problems to be met. How big can the machine be? How much will users pay for it? What else does it have to be compatible with?

We are building unrealistic expectations about the newly emerging imaging technologies

*Continued on page 22*

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Wohl is president of Wohl Associates in Bala Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

# Life in the changing LANscape

*The goal: networking as simple as making a phone call 'round the world*

HARVEY NEWQUIST III

What's the hottest topic on everybody's lips these days, besides the political conventions? Right — LANs.

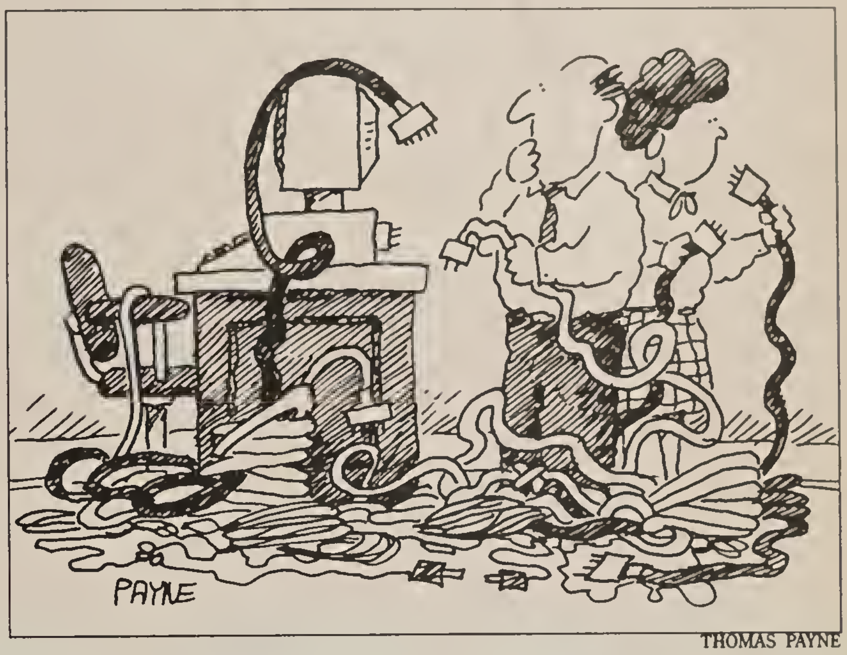
Local-area networks are not new, and they are by no means a technology you should have to wait for.

LANs have followed the traditional path of being embraced by engineering and manufacturing environments and only later being recognized as valuable by data processing departments. This syndrome, long prevalent in MIS, is known in psychology as the "Aha!" phenomenon.

Basically, it works like this: All the pieces of a puzzle are sitting in front of an individual who can't quite fit them together. One day it hits the person with all the subtlety of a flying mallet — "Aha!" He can see the solution.

Other cases that hit the MIS department in a similar fashion are personal computers, relational databases and expert systems. LANs are now a part of the "Aha!" experience.

As long ago as 1978, the International Standards Organization (ISO) started looking into the creation of an Open Systems Interconnect (OSI) network. Hewlett-Packard had devised its DS Net for cell controls in the factory — in 1973. That was 15 years ago.



THOMAS PAYNE

Shortly after the ISO began its effort, Data General had its Xodiac Network Bus for engineering workstations, Allen-Bradley its Data Highway, Texas Instruments its Tiway and Gould its Modbus — all for factory applications. These protocols were implemented before MAP was even a twinkle in networkers' eyes.

Some basic office-networking schemes started up at the same time, although they generally were a little slower off the mark. This group included Xerox's fabled Ethernet, the former Burroughs' BNA, Honeywell's DSA and early (circa 1976) proprietary versions of Decnet. In September 1980, Xerox, Intel and DEC banded together to publish joint specifications for Ethernet.

Huge advancements occurred when certain companies and organizations realized the benefit of adhering to a single protocol. The continued efforts in OSI were displayed at the 1984 National Computer Conference (which now rests in peace) by vendors intending to support that model for both factory and office use.

But other vendors with bigger and better ideas quickly appeared. A prime example is Sun Microsystems with its Network File System, or NFS, which was introduced to the workstation community in 1985. Soon, a host of vendors hopped on the NFS

*Continued on page 22*

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Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

# Could high-tech have beaten stress?

J. A. SAVAGE

I put the following question to some in the supercomputer business: Would the apparently stressed-out crew aboard the *U.S.S. Vincennes* be able to distinguish a passenger plane from a fighter plane if outfitted with state-of-the-art computer systems?

Would 290 civilians on a short trip across the Persian Gulf still be alive if Pentagon procurement policies allowed for rapid implementation of technology?

The Iranian Airbus may not have been mistaken for enemy aircraft if the U.S. Navy had a reasonable low-end technical computer with graphics capability to assist decision-making in the heat of battle, some say. Keep in mind that the critical information processing bottleneck occurred in the decision-making process, not the missile-firing and target capability.

"It was a fairly simple problem to resolve," says Gordon Bell, chief engineer at Ardent Computer and creator of the first minicomputer. Feeding battleground data into a graphics computer geared for processing may have helped overcome human errors identified in the recently publicized military investigation.

The unwieldy requirements and resulting slowness of federal procurement policies, it seems, ensure a lack of computing power on board.

If the on-board computer did have enough power to process the information in time to distinguish a civilian from a military craft but received radar and sonar signals that fed incomplete information, that's another technological story. Current satellite scanning instruments could have solved this problem.

If the technology exists to save innocent lives in a military situation, why isn't it used?

The deities and former Defense Secretary Caspar Weinberger know that cost isn't the prohibitive factor. Aside from bagmen with suitcases full of bucks to lobby defense contracting, the only reason I can envision is the outdated, bug-ridden procurement policies.

David Packard, Hewlett-Packard founder and former undersecretary of defense, testified to the Senate Armed Services Committee in late July that current procurement policies are indeed useless. He likened the system to "an Iranian bazaar" in complexity.

It can take years for vendors to break into defense contracting. But once there, they are apparently cast in cement. And the weight of the contracts keeps new technology from being introduced in a sorely needed area — saving lives.

The missile-coordinating part of the Aegis system worked quite well; it is apparently in the weapons area where procurement policies lie.

---

Savage is a *Computerworld* West Coast correspondent.

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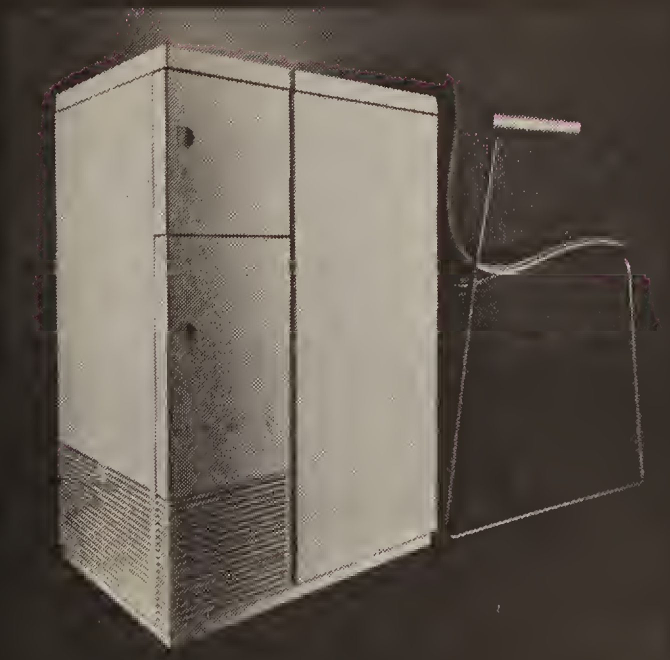

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# LANscape

CONTINUED FROM PAGE 19

freight train. Getting vendors to sign on was fairly easily accomplished, and no doubt Sun wishes they were just as eager to be part of its current endeavors in Unix.

### Transients and holdouts

Another obvious example of a communal networking breakthrough is the Manufacturing Automation Protocol, better known and appreciated by everybody (except DEC) as MAP.

Lots of other networks have come and gone, and some have even managed to hold on: IBM's Token-Ring and PC/Net, Micom's Instanet, Zilog's Z-Net, 3Com's Cheapernet, GE's Genet and Network Systems' Hyperchannel are only a few of the myriad networks introduced during the past decade.

Yet for all the interest in LANs during the time of their emergence, once installed they became taken for granted as just part of the system, much as the telephone is. While the peripherals to the network received all the attention, the actual link — the network itself — was largely ignored.

As such, there are few comprehensive network software designers and implementors who are able to move LANs into the field of office automation with a sense of ease and savoir faire. In fact, a lack of expertise pervades the entire business of networking.

> THERE ARE few comprehensive network software designers and implementors who can move LANs into office automation with a sense of ease and savoir faire. A lack of expertise pervades the business of networking.

So for all the recent talk about LANs, it really comes down to the computer industry committing resources — namely, manpower, time and money — to develop workable networks. MAP is a good step, but unfortunately, not everyone thinks so.

The recent commitment on the part of vendors to adhere to a proposed OSI information exchange format could also help. Ultimately, it comes down to how important the need becomes in the customer base in the next few years and how forcefully users press that need on vendors.

Maybe someday all computers will be able to network together, just like in the phone system. Because as much as the average user complains about service, there's a great deal to be said about the fact that you can pick up a phone anywhere in the U.S. and communicate with any other phone in the world.

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# Silent partners

CONTINUED FROM PAGE 19

as well, particularly those that deal with recognition. A few weeks ago, I was describing a product that can read a particular individual's handwriting based on PC (Intel 8088) technology. "It doesn't read cursive handwriting," the local cynic complained.

He meant that this product, from Linus Technologies, Inc. in Reston, Va., required that you lift the pen at the end of each handwritten letter so the system would not need to understand how to tell when letters begin and end.

Of course, it would be better if a system could understand everyone's handwriting without training and without any changes in the writer's normal behavior. But isn't having partial solutions now at a reasonable cost preferable to waiting for "full" solutions at any cost?

Some imaging problems are already solved. We can read characters of any size or reasonably consistent style, in any mixture, on very inexpensive (less than $5,000) products. We can recognize columns and separate text from graphics. Soon we may be able to both associate recognized text with accompanying images and find those images by automatically generated indexes. Should we refuse to buy such products because they don't also recognize the content of images?

### Making do

What we need to learn is how useful each of the above tools can be at each stage of its development. A computer will not listen to your ordinary speech and immediately render a clever reply. And no, the computer will not then translate this reply into perfectly parsed French or Chinese. But we are moving along the path.

One piece of technology can capture human speech and another paper images. Another bit can examine them and offer partial analysis and recognition.

It is the addition of these technological wonders to one another, rather like the accretion of layers of luster on a pearl, that in the end add up to something wonderful, useful and valuable.

Pioneers can see and try these things as they happen, with their small expectations often leading to pleasant and useful surprises. Those with overblown expectations will always be disappointed by the smallness of reality.

# SYSTEMS & SOFTWARE

HARD TALK

*Stanley Gibson*

## IBM plays it to the limit

Wasn't it obvious?

While 1987 was a year of dramatic price cuts in IBM maintenance, 1988 has been a year of price increases.

You just knew it was going to happen, didn't you — that after setting an upper limit of 3.5% for price increases under its Corporate Service Amendment (CSA), IBM would raise prices by 3%? You have to give IBM credit for not raising prices 3 and 7/16%.

Under CSA, a customer can withdraw with no notice or penalty if maintenance prices for a given location rise more than 3.5%. To withdraw otherwise, notice (six months under the five-year plan) must be given.

A user who pulls out can go with regular maintenance, which would make his bill, say, 15% higher than under CSA. Or he can go to a third party.

**Bad dream?**

So, will users wake up in a panic, give IBM notice and then shop around? No. After all, they signed the CSA agreeing that if IBM raised prices to 3.5%, it would be all right. And they had put out of their minds shopping among maintenance vendors for a few years. How many people go to the trouble of moving out of their apartment when the landlord raises the rent by 3%?

Indeed, the third parties,

*Continued on page 29*

## Tardy Posix ensnared in political tug-of-war?

ANALYSIS

BY ROSEMARY HAMILTON
CW STAFF

The National Bureau of Standards' (NBS) interim Posix specification — which was to be required in government contracts until an IEEE standard could be settled on — is still awaiting approval, although it was expected to receive the official nod several months ago.

The interim specification, proposed by the NBS last year as a federal information processing standard for the Unix operating system, awaits signatures from the necessary government agencies such as the U.S. Department of Commerce, according to NBS officials.

Once consensus is reached, federal agencies follow the standard and use their collective purchasing power to require vendors to submit bids that meet its criteria.

**Behind the scenes**

James Isaac, Posix strategy director at Digital Equipment Corp., suggested last week that a political tug-of-war may be going on behind the scenes. Contracts that have been advertised for the U.S. Air Force, Department of the Treasury, Federal Aviation Administration and others amount to more than $5 billion, industry sources noted.

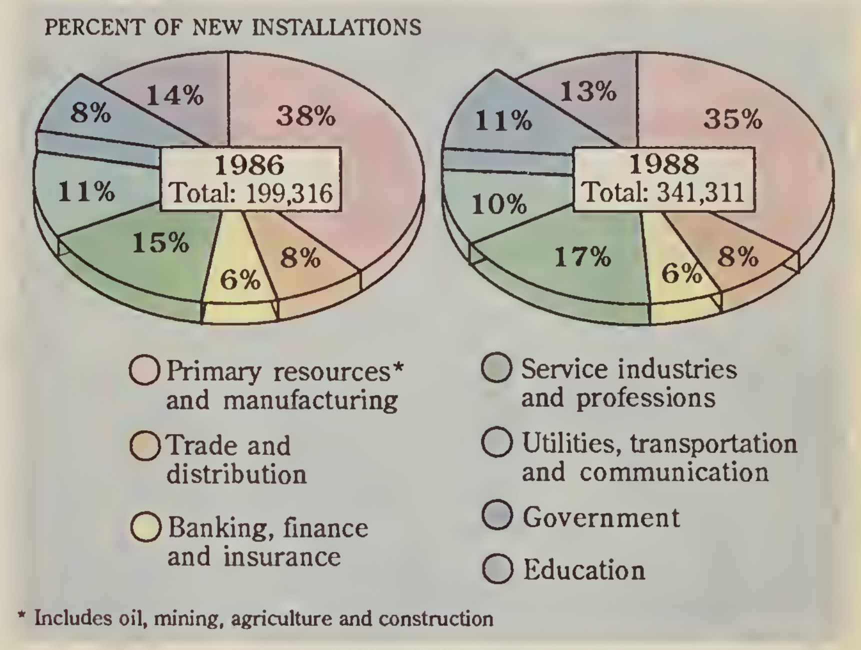
In the group of vendors pursuing these contracts, some, like DEC, comply with the NBS interim standard and some are waiting for the complete or so-called full-use Posix specification from the IEEE.

"There are major procurements in the works," Isaac said. "By holding back or pushing [the interim standard] forward, dif-

*Continued on page 29*

### Government Unix growing

*A breakdown of new installations by sector shows the government claiming a larger share of the total number of systems*



* Includes oil, mining, agriculture and construction

INFORMATION PROVIDED BY NOVON RESEARCH GROUP
CW CHART

## More C series processors from Convex

BY STANLEY GIBSON
CW STAFF

RICHARDSON, Texas — Convex Computer Corp. recently added two C series processors, announcing the C201 and C202, which replace the Model C130.

Both systems incorporate the parallel architecture announced in Convex's C series earlier this year and are compatible with C series Models C210, C220, C230 and C240.

As an entry-level system, Convex retains the C120 model. A C120 user moving to a parallel system would have to recompile his code manually for the parallel processing, a Convex spokesman said.

The C201 is a single-processor system that can be expanded to the C202 by inserting an additional processor in the cabinet. Each processor is a 64-bit scalar and vector computer. The C201 and C202 can be expanded to 2G bytes of physical memory.

The C201 is capable of 23 million instructions per second (MIPS) on the Whetstone benchmark; the C202 can perform 46 Whetstone MIPS.

"This time you can start with the C201 and plug in a board to get the C202," said Omri Serlin, president of Itom International, Inc. in Los Altos, Calif.

The C201 starts at $495,000; the C202 is priced at $755,000. The C201 has already been shipped to several customers, and the C202 is scheduled to ship in September.

## Minis chart race course

### *DG systems keep boats on-line in Mackinac dash*

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — For 100 years, the intrepid sailors who challenged Lake Michigan in the Mackinac Island race treasured the silence of the 333-mile journey from Chicago to the tip of Michigan's Upper Peninsula. The reason was simple: Silent running allowed the contestants to slip past competing sailboats.

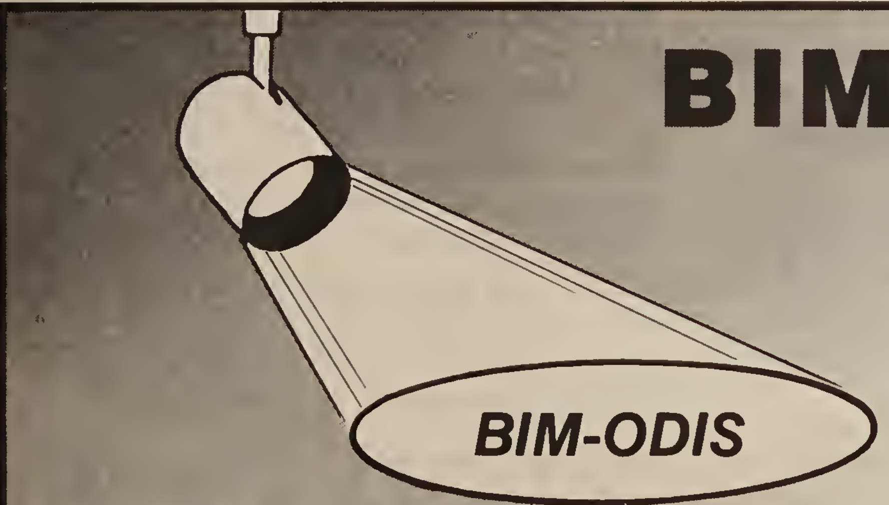
This year, officials at the Chicago Yacht Club as well as anxious relatives waiting at Mackinac Island will have an idea of what is going on offshore through a computer system installed by the race's cosponsor, Data General Corp. "Traditionally, the boats leave here and you don't see them again until they reach the end of the race," said Alan Cox, regional manager of DG's Chicago office.

But this year, those who awaited the race's end July 25 knew where the boats were — plotted within grids that were

*Continued on page 28*

**Inside**

- Index links Excelerator, DEC's CDD/Plus. Page 25.
- The New England uses technology to monitor agents. Page 25.
- Pyramid boosts Series 9000 line. Page 25.
- CDC, Emulex announce service program. Page 25.



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*Director of Computer Services*
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"MANTIS was ideal for us because you don't need 2-3 years of experience to use it," explained Bill Clontz, Director of Computer Services at Holly Farms. "It lets us take new graduates, quickly train them and, in a matter of weeks, turn them into valuable programmers."

As a result, programmer productivity at Holly Farms has reached an all-time high. "We've seen substantial improvement ratios," Clontz said. "In the time a programmer might turn out one CICS command-level program, he can turn out from six to eight programs on MANTIS."

Most of the 500-plus MANTIS applications now in production at Holly Farms are aimed at streamlining costs. For example, Data Processing used MANTIS to develop a model of how chickens consume feed over the course of their lives, allowing Holly Farms to cut production at one of its feed mills by 1½ days a week.

"We've got key users who are picking up on the term 'MANTIS,'" Clontz noted. "Around here, MANTIS has become a synonym for 'get it done quickly.'"

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SOFT NOTES

# Index Technology links with DEC dictionary

Two market leaders pooled strengths last week when **Index Technology Corp.** announced a link between its Excelerator front-end design and analysis tool and **Digital Equipment Corp.'s** VAX Common Data Dictionary/Plus (CDD/Plus). CDD/Plus, which debuted last month along with DEC's on-line transaction processing entry, adds distributed capability and open architecture foundation to DEC's CDD, with which it is compatible, said DEC marketing manager Larry Vifquain.

The link, which is slated to be available next month, runs on all Vaxstations under VMS and lets users merge and integrate data from Excelerator and DEC's Case/IS product line.

It will reportedly include a user interface with windows, which allows users to simultaneously view and manipulate data resident in Excelerator/IS and in CDD/Plus as well as transfer design data from DEC's system to Index's.

**Must Software International** recently reported that it has acquired the rights to **Decision Resources Corp.'s** Rapid Information Processing System, a personal computer-based executive support system. Must said the product is "synergistic" with Nomad, its fourth-generation language development environment.

**IBM** may be grabbing the headlines as the newest **X/Open** member, but other companies continue to swell the X/Open ranks. **Language Processors, Inc.**, a maker of software development tools located in Framingham, Mass., recently signed on as an X/Open Software Partner.

**Walker Interactive Systems** in San Francisco has made available its mainframe financial application suite for the IBM DB2 environment. Sold under the name Strategic Management Systems, the applications include management, budgeting and accounting, general ledger, accounts payable management, purchase order management and productivity tools.

**Knauer Publishing** in New York has released **The Directory of DB2 Tools**, a listing that profiles the currently available software tools for the IBM relational database management environment.

The state of Indiana recently picked **Management Science America, Inc.** (MSA) to provide financial and human resource software. The state also licensed Information Expert, a fourth-generation language tool that will be used to help swap data between MSA and non-MSA systems.

**Harris Corp.'s** Computer Systems Division and **Informix Software, Inc.** have announced that they will jointly market the Informix line of relational database management systems and development tools for the Harris CX family of Unix-based systems.

**Prime Computer, Inc.** in Natick, Mass., and **Progress Software Corp.**, which is based in Bedford, Mass., recently announced that the Progress fourth-generation language and DBMS is available on Prime's EXL family of Unix-based supermicrocomputers. The two firms have also signed a worldwide joint marketing agreement.

# System inspects agents' work

**ON SITE**

BY NELL MARGOLIS
CW STAFF

BOSTON — An insurance company is only as good as its agents. But until 18 months ago, The New England — formerly New England Mutual Life Insurance Co. — did not have an efficient way of finding out how good its agents really were.

Today, a user-driven experiment in executive information systems is giving the Boston-based, $2.8 billion a year in premiums company an eagle's-eye view of the performance of its 3,700 agents in 90 locations around the country.

The data needed for the lean, meaningful performance of so essential a task simply was not available, said Robert A. Shafto, president of The New England's Insurance and Personal Finance Division.

"We had a lot of data stored, but stored as the product of transactions," Shafto said. "Also, a lot was stored in PCs and wasn't integrated — not to mention what we had on paper." With agents selling a broad spectrum of both insurance-based and financial products and services, "what we needed was something to help us know how well they were doing against some stated goal, plan or pricing assumption," he said.

Eighteen months ago, Shafto, a veteran of the technology industry — he spent seven-plus years at Electronic Data Systems Corp. with H. Ross Perot — declared an end to the paper chase. He deputized his executive assistant, second vice-president Vince Ficcaglia, to build a system that would allow him to see and manipulate a wealth of performance data.

## Paper chase over

Today, the data that used to be scattered throughout The New England in paper reports and disparate databases is combined into a host database that gets downloaded once a month into a hard disk on an IBM Personal System/2 Model 80 on Shafto's desk. Using Comshare, Inc.'s System W software, Ficcaglia and crew developed a set of 13 screens that allow the executive to see, in chart and graph form, what and how each agent is doing, both in the abstract and against given goals.

"Integration and clarity" are the key concepts that distinguish the system, Shafto said. "It's not that we have information that we didn't have before. It's that the software organizes and communicates it in a way that is so much quicker and cleaner."

The screens let the user determine at a glance not only a given agent's sales record or an agency's recruiting history to date but also whether an agent whose bottom line is expanding is selling to more clients or selling more products to clients already brought on board.

**The New England's Shafto**

While it is too early in the game for Shafto to show tangible evidence of the system's success, he has no doubt of the positive effect. "You get what you *in*spect, not what you *ex*pect," he said. "People respond to what they know management is looking at. The reaction at all levels has been very positive."

Positive, yes, but not unanimously popular. One agent, confronted with graphical evidence of his lagging performance, resigned, Shafto said.

# Performance elixir revives Pyramid minicomputer line

BY J. A. SAVAGE
CW STAFF

MOUNTAIN VIEW, Calif. — Squeezing increased performance out of its 2-year-old line of multiprocessing minicomputers, Pyramid Technology Corp. announced four additions to its Series 9000 systems.

The systems offer increased performance — as much as 75% for database applications and 300% in terminal-intensive environments — according to the vendor. Pyramid also lowered prices on earlier models.

Pyramid, which already counts the bulk of its customers as being in the commercial marketplace, appears to be bending over backward to please those users. This includes offering Cobol 85, SQL database interfaces and Unisoft Corp.'s emulation of IBM's CICS.

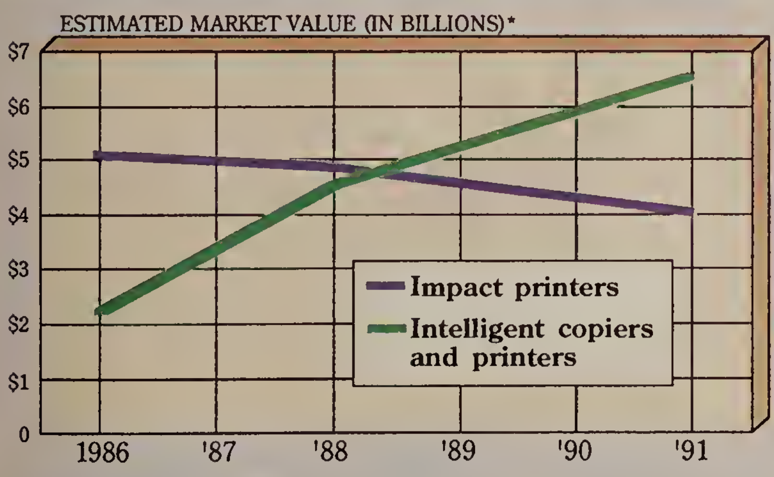
The four new reduced instruction set computing systems, with one to four processors, are called the 9000-TA models. They range from 7 million instructions per second

*Continued on page 28*

# Data View

## Gaining intelligence

*As impact printer sales slide, intelligent nonimpact copiers and printers gain popularity*



*Sales revenue plus value of rental units

INFORMATION PROVIDED BY CAP INTERNATIONAL, INC.
CW CHART

HARD BITS

# CDC and Emulex invade DEC's digs

Continuing its foray into the Digital Equipment Corp. maintenance arena, **Control Data Corp.** announced a program under which **Emulex Corp.** will offer CDC's on-site warranty service on a Performance 4000 Ethernet terminal server.

Emulex's Performance 4000 is the first third-party Ethernet terminal server to be fully compatible with DEC's Local-Area Transport protocol, according to Emulex. Under the program, users of the terminal server receive one year of warranty service provided by Minneapolis-based CDC's Technical Services division.

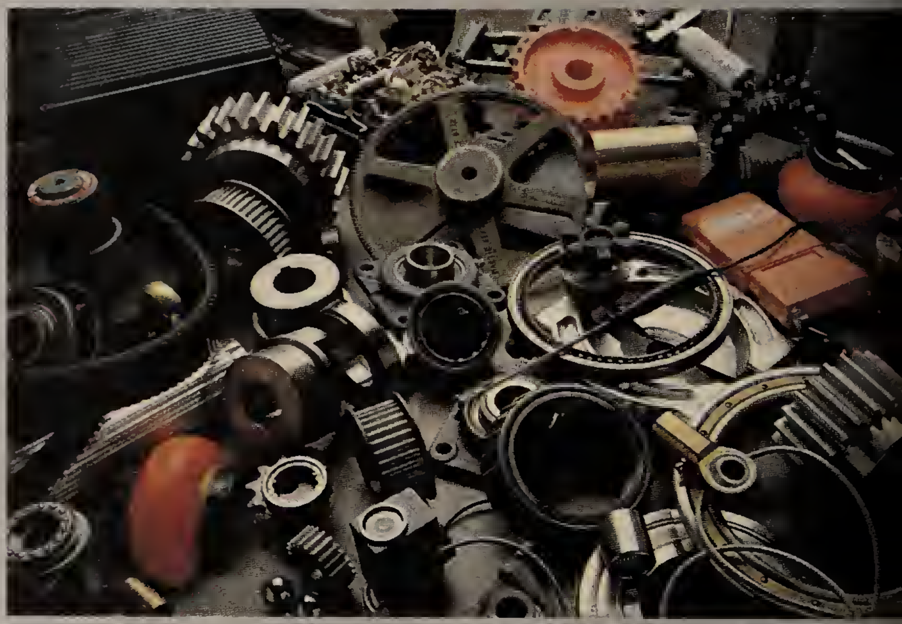
**Cipher Data Products, Inc.**, headquartered in San Diego, announced that Harris Corp.'s Computer Systems division based in Ft. Lauderdale, Fla., signed a $2.4 million, two-year contract for Cipher's ST150S ¼-in. cartridge tape drives and Microstreamer and Cachetape ½-in. reel-to-reel tape drive products.

Harris will integrate the ST150S drives, which provide 150M bytes of storage, into the HCX superminicomputer, a Unix-based system used for transaction processing, database management and other departmental applications. The Microstreamer and Cachetape, with 92M bytes of storage, will be integrated into Harris' HCX and H superminis.

The **Oregon State System of Higher Education** recently signed a contract valued at more than $2 million with Honeywell Bull, Inc. in Minneapolis. The contract is for a DPS/8000/82 system that will perform administrative processing.

The Oregon state education system consists of eight institutions: three four-year universities, a health-science university, three state colleges and a polytechnic institute.

# Digital has it now.



Kaman Corporation is a *Fortune* 500 company and one of the nation's largest industrial distributors. Kaman Bearing & Supply, its subsidiary, is connecting its 165 branches throughout the U.S. and Canada with a computer network from Digital. According to Harvey S. Levenson, President, "Digital is providing a network for transaction processing that will give each of our branches instant real-time access to the company's entire nationwide inventory – in effect, one 'big back room' for distribution."

"Transaction processing that lets Kaman manage an inventory of over 800,000 industrial parts with no paperwork."

Digital's technology played a major role in Kaman's choice. Levenson stated, "We needed reliability, flexibility and as few people as possible to run the system. We're getting a distributed transaction processing system to track the state of our business, and it's the most cost-effective of all the alternatives we've examined. Digital helps Kaman be more competitive; we'll run our business and serve our customers better, faster and smarter."

To get your competitive advantage now, write: Digital Equipment Corporation, 200 Baker Ave., West Concord, MA 01742. Or call your local Digital sales office.

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## Minis

CONTINUED FROM PAGE 23

10-miles square. DG MV/2000 minicomputers estimated the sailboats' positions by using data points on the July 23 start at Chicago's lakefront, at a mid-race checkpoint and at Mackinac. Custom software took several factors into account, including average boat speed and weather conditions. Weather information was fed into an MV/10000 minicomputer at Kavouras Weather, a private weather service in Minneapolis. The MV/10000 communicated with two MV/2000s — one at the Chicago Yacht Club and one at Mackinac Island.

"We're plotting estimates of the points in between," DG spokesman Andrew Hettinger said. "That's not definitive, but until we added computers, the results were posted on a piece of paper." Even estimates can be thrown off by unusual weather conditions, as they were by a tail wind last year that knocked five hours off the record time for the race. A Mackinac race usually takes 30 to 48 hours to complete, but last year's was won in 25 hours.

Last year — DG's first as a Mackinac sponsor — end users had to scroll through a list of all 300 race entrants to find an individual boat's position in the race. This year, DG improved on that by customizing a Microrim, Inc. Rbase 5000 that can be accessed from multiple DG Dasher 286 personal computers. The minicomputers hosting the database communicate over AT&T voice-grade lines using the CCITT X.25 packet-switched protocol.

At least one sailboat in the race, the Swedish *Carat*, also made use of an onboard DG One portable computer. The computer was used on deck as a navigational support system while data was fed into a below-deck unit from four wind-direction sensors.

## Performance

CONTINUED FROM PAGE 25

(MIPS) to 25 MIPS, a rating that has not increased from the earlier models. Instead, the increase in efficiency comes in software and cache improvements, according to Pyramid.

For database applications, increased performance of 35% to 75% is the result of an interleaved virtual cache subsystem, according to Jim Hughes, manager of product marketing.

Improvements from 60% to 100% in communications networks also come from the new cache because the Transmission Control Protocol/Internet Protocol system can pass packets of information faster, Hughes said.

The entry-level system, the Model 9815, starts at $128,000.

At the high end, the Model 9845 starts at $425,000. Pyramid lowered the price of last year's 7-MIPS Model 9810 to $110,000, a 28% decrease.

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## Gibson

CONTINUED FROM PAGE 23

many of whom followed IBM with price cuts last year, may follow suit now with price increases on the order of 3%. If this happens, there will be even less reason to switch.

**Same old thing?**

Many would say all this is typical of IBM: to buy market share through low prices and then, when users are locked in, raise prices.

While users might view the increase as an irritant that does not greatly change their plans, IBM's maintenance policies are making what may be permanent changes in the maintenance landscape.

Time-and-materials maintenance is getting further and further out of the question. While maintenance went up by 3%, time-and-materials charges were boosted by 5%.

Earlier this year, IBM restricted time-and-materials service to weekday business hours except in life-threatening emergencies.

This squeezes third parties, because they will be unable to call on IBM to provide service in a pinch — a practice some had employed.

In addition, the 5% price hike applies to spare parts, so third parties buying these from IBM will have to pay more.

On the bright side, however, IBM is making parts available to volume purchasers on a 24-hour basis, as the result of a recent policy change.

Third parties have put up a brave front, saying they have seen little adverse impact from CSA and the other policies. But most third parties admit that CSA at least froze the maintenance decision-making process for a number of customers. Industry analysts say although the third parties may still be in business, their margins are being squeezed. They have cut staff and otherwise reorganized to make ends meet. Without question, CSA has hurt them.

**Users gain**

All this raises the question of whether there will be competition in the maintenance market in the future and, in the long run, whether the user stands to gain. The answer to that question would seem to be self-evident: The presence of competition helps the user; its absence hurts him.

This column has suggested before that users owe it to themselves to shop around in as many areas of computing as is feasible. Because without competitive bidding, there can be no leverage on vendors.

But already it is late. Maintenance prices may not yet be far out of line. But in the future, getting true value for a maintenance dollar will become an ever more elusive goal.

Gibson is *Computerworld's* senior editor, systems & software.

## Tardy Posix

CONTINUED FROM PAGE 23

ferent vendors could benefit."

James Hall, a computer specialist with the NBS, said there is no behind-the-scenes fighting over the interim standard. When asked why approval has been delayed several months, he said "there's no good reason I can give you. I guess [the government agencies] want to be sure that everyone gets a look at it."

Asked when he expected the interim standard to become official, Hall replied, "It's the same old answer: Any day."

The interim standard was proposed by the NBS as a way of working around the slow approval schedule that has befallen the IEEE Posix standardization process. In 1984, the IEEE took over the Unix users group effort to establish a set of common, low level interfaces to Unix services.

While neither the NBS nor the IEEE standard is in final form, computer companies are taking different approaches to the proposed NBS interim standard. Unlike DEC, both IBM and Apollo Computer, Inc. have said they will wait until both the NBS and IEEE standards are published.

Until the interim standard becomes a federal information processing standard, the NBS says vendors should specify Unix functionality rather than referencing a Posix specification when responding to a government request for proposal.

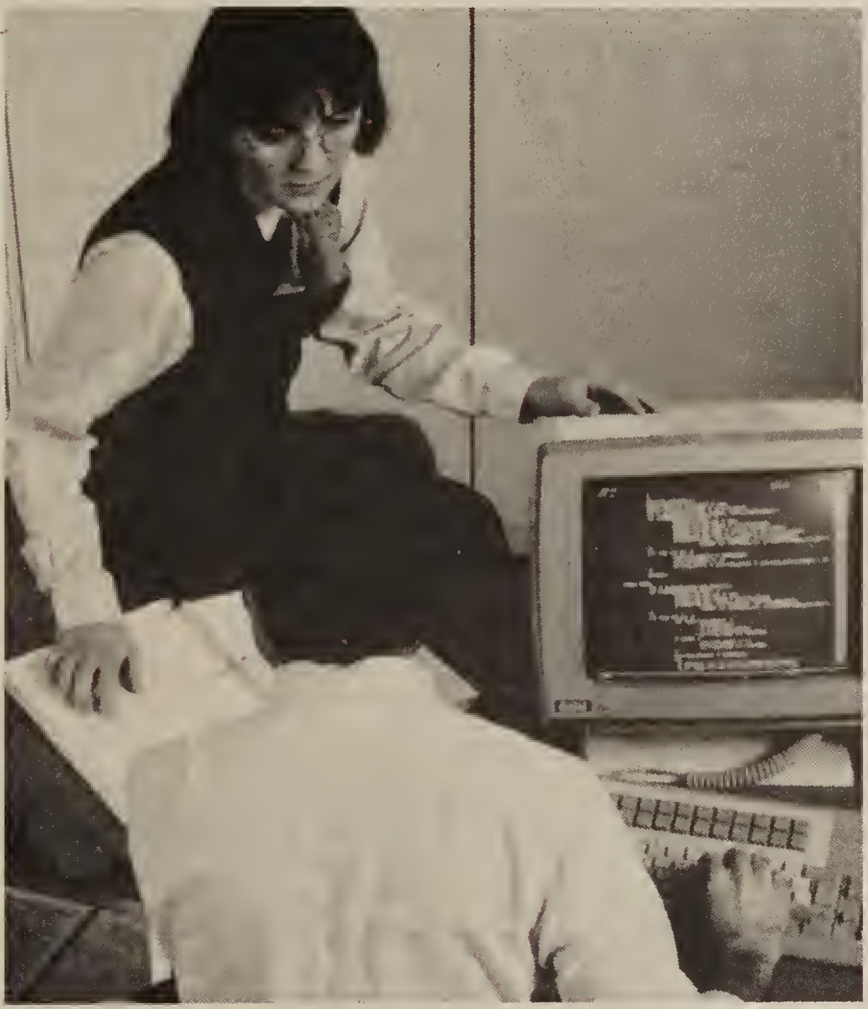
**Critical issue**

The interim standard was an unusual move on the part of the NBS because it assumed a lead role rather than waiting for standard-setting bodies to publish criteria. However, the need for a Unix standard became critical over the past two years, as many government agencies put out contracts amounting to several billion dollars for Unix-based systems.

Eventually the NBS-Posix standard will be based on the full-use IEEE Posix due out this fall. It will depart from that standard in areas that the IEEE has identified as options and the NBS has identified as requirements.

In the meantime, some amount of confusion is swirling around the two agencies' efforts.

At Apollo, the interim standard is considered "a moving target" by Barbara Shelhoss, director of domain software product marketing. "We're very close to compliance with the interim standard," Shelhoss said. "But right now we will wait until the IEEE is finalized."



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## NEW PRODUCTS — SYSTEMS

### Processors

**Nemonix, Inc.** has announced its next generation of system expansion products for Digital Equipment Corp.'s VAX.

The upgrade was designed for VAX-11/780 users and is said to increase overall systems throughput by 45%.

The **Nemonix NX780-SPU** is hardware and software compatible and includes proprietary micro diagnostics, memory diagnostics and benchmark software. The product also includes the CPU upgrade and 16M bytes of Nemonix memory.

The NX780-SPU costs $29,900.

Nemonix, 106 South St., Hopkinton, Mass. 01748. 508-435-9087.

### Data storage

A memory trade-up policy announced by **Dataram Corp.** allows users of Data General Corp. MV series computers to increase performance by adding memory without using additional expansion slots.

Under the new plan, users may trade in their existing memory boards for higher capacity boards from Dataram. The trade-up policy is said to apply to original DG and Dataram boards and covers memories for most DG processors, including the MV/15000 and MV/20000 models.

Dataram manufactures DG-compatible memory boards in capacities ranging from 2M to 32M bytes.

The trade-up allowance plan is effective immediately.

Dataram, P.O. Box 7528, Princeton, N.J. 08543. 800-822-0071.

### I/O devices

**Magna Computer Corp.** and the **Computer Products Division** of **Computer Consoles, Inc.** (CCI) recently announced a cooperative marketing effort that will make Magna's **Falcon Enhanced Terminal** available through CCI resellers.

The Falcon terminal is a high-resolution, alphanumeric graphics workstation that features Wang Laboratories, Inc. 2200 and Digital Equipment Corp. VT100 and VT220 emulation capabilities.

The basis of the relationship is a crossover in the distribution networks of Magna and CCI, a Magna spokesman said. Magna is a peripherals manufacturer in the Wang market with a strong Wang 2200 reseller network. CCI targets the same market with its Power series of minicomputers and superminicomputers and the Basic K compiler.

The Falcon terminal costs $995.

Magna Computer, 24 Keewaydin Drive, Salem, N.H. 03079. 603-898-3555.

## NEW PRODUCTS — SOFTWARE

### System software

**Hewlett-Packard Co.** has announced **HP Laserrom** for the HP 9000 Series 800 HP-UX computers, a service that delivers Unix operating system documentation and support information on compact disk/read-only memory.

According to the vendor, HP-UX adheres to AT&T's Unix System V Interface Definition Issue 2.

The initial version is said to contain the hard-copy equivalent of more than 10,000 pages in electronic form and will allow users to electronically search and retrieve information related to a Unix operating system. Topics include software design, support information and development manuals.

HP Laserrom for the HP 9000 Series 800 HP-UX computer is priced at $1,800 for a 12-month subscription, according to the vendor.

HP, 3000 Hanover St., Palo Alto, Calif. 94304. 415-857-1501.

**Information Processing, Inc.** has announced a low-end pricing structure for its **Blis/Cobol** multiuser operating system.

The system was designed as a virtual-memory, multiuser on-line operating system and compiler for Data General Corp. machines and other DG Nova-compatible minis.

The price reductions will have the most impact on systems with one to 10 users, according to the firm. For example, a single-user 128K-byte system has reportedly been reduced from $1,280 to $440. A 10-user 128K-byte system has been reduced from $4,980 to $4,400.

Information Processing, Suite 1825, 427 Whooping Crane Loop, Altamonte Springs, Fla. 32701. 407-331-5200.

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# MICROCOMPUTING

## MICRO BITS

Douglas Barney

### Green believes

**Turning green.** Those in the Dbase community must know, or at least have heard of, Adam Green. This Dbase teacher and sometime columnist has articulately placed Ashton-Tate's Dbase language on a pedestal and, through much consulting, helped determine the ultimate design of some key products.

But being perhaps the ultimate Dbase language aficionado, Green at first resisted the move to this thing called SQL. And none of the people Green trained at Dbase seminars seemed to care about SQL, either. But something apparently clicked when Green was toying around with, of all things, a prerelease version of Dbase IV. He found SQL.

Unlike the vendors, Green does not spout off about connectivity, client/server architecture and the relational model. He simply likes the language, and the SELECT command in particular, for what it can do with Dbase files. For some queries, SELECT can replace "a dozen nested DO WHILE.NOT.EOF() loops in Dbase," Green wrote in a recent column. SELECT

*Continued on page 35*

# Northern challenge

*Finns target DBMS server at U.S. market*

BY DOUGLAS BARNEY
CW STAFF

HELSINKI, Finland — From the land of long winter nights and moss-eating reindeer comes a database management system server aimed at the heart of IBM's personal computer software strategy.

And the company marketing the product appears as brash as Matti Nykaenen, who came away with all the gold medals in ski jumping at the 1988 Winter Olympics. In fact, Princeton, N.J.-based Via Information Systems Corp., which sells Via/DRE, has issued a challenge to all comers: Outperform us if you can.

Despite the tough talk, Via is still largely unknown in the U.S. But it does have many of the ingredients for success. The support for SQL is there. It runs on many popular local-area networks. And its supplier boasts of terrific response times.

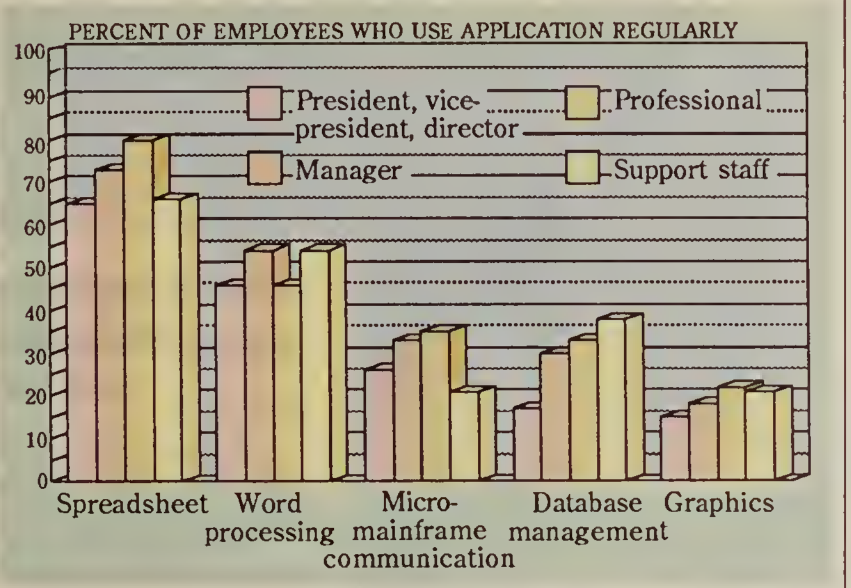
Even that may not be enough to succeed for a U.S market targeted by U.S. suppliers such as Oracle Corp., Lotus Development Corp., Sybase, Inc. and others. Although the U.S. market may be tough to crack, Finland seems to be another story. The largest law firm in Finland, Procope & Hornborg, uses Via

*Continued on page 35*

## Data View

### Most wanted

*Spreadsheets top list of applications regularly used by various employee groups*



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

# Big Eight counting on Microsoft's Excel

BY STEPHEN JONES
CW STAFF

Early reports from the front lines of the spreadsheet wars show Microsoft Corp. well on its way to capturing a critical position among Big Eight accounting firms from industry leader Lotus Development Corp.

Although Microsoft's Excel is far from overcoming the high sales of Lotus' 1-2-3, it has won over users at four of the nation's Big Eight accounting firms.

Lotus had been entrenched as the de facto leader among Big Eight firms, but that started to change earlier this year when Microsoft made its first rush at accountants with aggressive marketing and cut-rate prices.

A group within Arthur Andersen & Co. has scuttled thousands of copies of 1-2-3 in favor of Excel for reasons such as ease of user training, higher performance, windowing capabilities and graphics. Much of the rest of the firm, however, is waiting for Lotus' next move, sources said.

### 'Quick and easy'

Longtime Excel user Peat, Marwick, Main & Co. has the application installed on roughly 10,000 Apple Computer, Inc. Macintoshes worldwide. "It's quick and easy to use, and we can train auditors in a short amount of time," said Dick Webb, partner in charge of Audit Technology. Webb applauded Excel's ability to link worksheets, its flexible macro language and its charting capabilities.

"Users are realizing that Excel is the next generation — it's not a question anymore of whether you're going to spend the money for it, but when," said Jack Dreiss, director of development at Arthur Andersen's advanced computer audit techniques group.

Excel fever has spread to Deloitte Haskins & Sells in New York, which tapped Excel as its standard spreadsheet for Intel Corp. 80286- and 80386-based PCs. With up to 1,800 high-end micros slated for purchase by year's end, Microsoft stands to markedly increase its presence in the industry.

Arthur Young and Peat, Marwick, Main & Co. have made similar recommendations for the Mac version of Excel. Sources said the England branch of Coopers & Lybrand, a 1-2-3 user, may also switch to Excel.

But with all its high-quality output and potential links to Microsoft and IBM's OS/2, Excel can be a hard sell for some. The biggest deterrent is cost: Excel runs best with at least 1.5M bytes of memory and a fast but pricey 80286 microprocessor.

**Inside**

- SQL DBMSs under the magnifying glass. Page 33.
- Minister solves Gerbil mystery. Page 33.
- Firm hammers out CASE developer's tool kit. Page 36.

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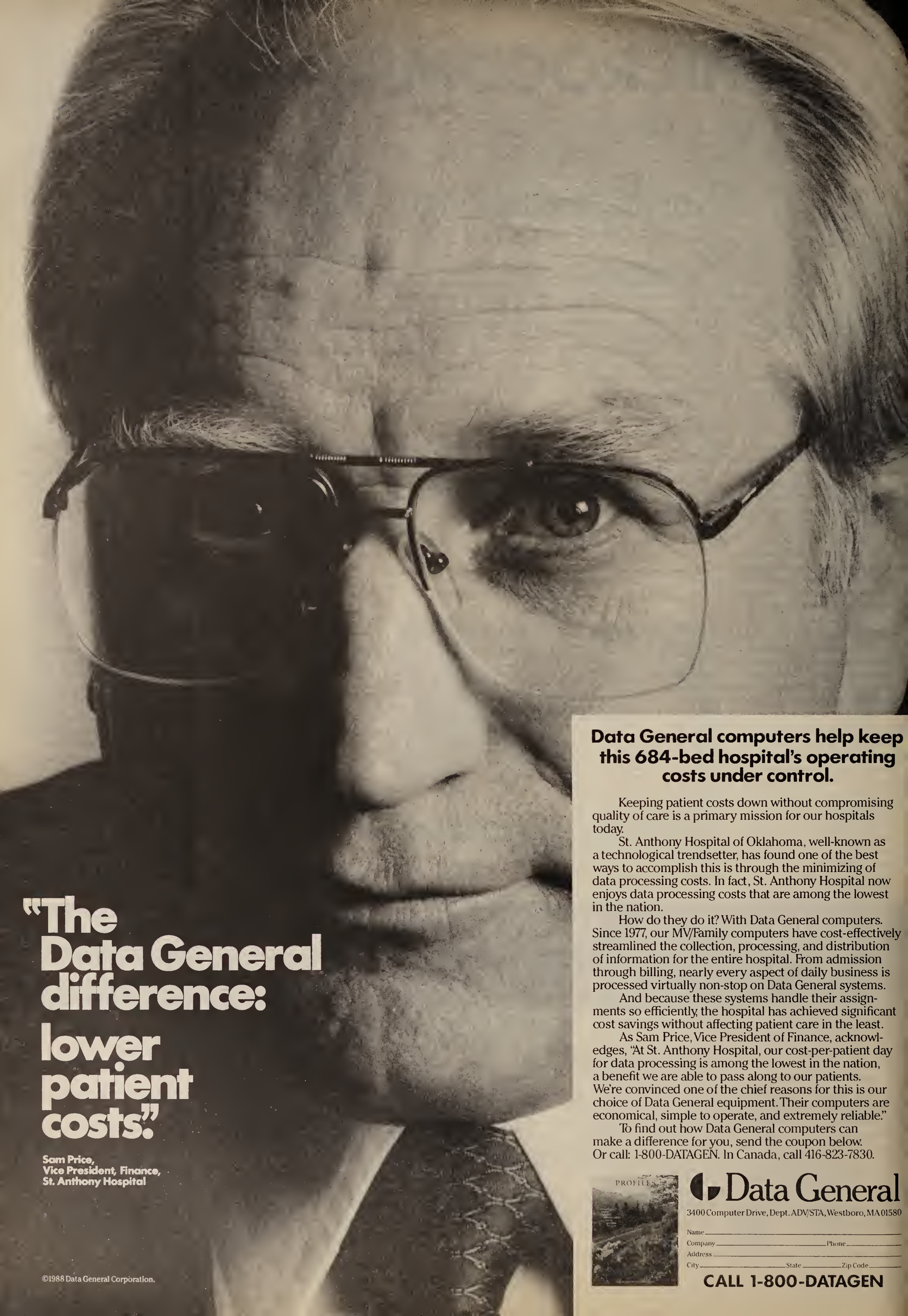
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SMALL TALK

*Mort Rosenthal*

## Beneath OS/2 surface

Vendors are worried. Analysts are perplexed. And the press is having a field day. All of this is over the demand — or, more precisely, the lack of demand — for OS/2.

Apparently, customers are saying that they are not going to use IBM and Microsoft's OS/2 for the next three years. Then again, given the way most vendors and analysts present OS/2, this is not a surprising reaction.

If you asked companies to lay out $325 for a new operating system and several thousands of dollars for additional memory, new displays and faster processors, their answer would be "No thank you." And that is where the story of the lack of demand for OS/2 begins.

But the operating system, memory and processors are not what users should be buying or considering buying. They should be buying OS/2's potential to fill application-specific needs.

Here's an example. Recently, the manager of information centers at a major insurance company emphatically told me his company would not be interested in OS/2 for a very long time. Later in our conversation, I asked him if he would be interested in an application that would easily connect all of his information centers and allow them to share the latest product information they had.

Knowing such an application could provide a much more effi-

*Continued on page 34*

# Vital stats for DBMS shoppers

## *Truly relational product must implement SQL genuinely, completely*

*First in a two-part series*

BY FABIAN PASCAL
SPECIAL TO CW

With the proliferation of products and announcements and the cacophony of vendors extolling their virtues, it should surprise no one that one of the most frequently asked questions is "Which PC DBMS should I use?"

But even though a simple answer is desirable, personal computer users must get used to the idea that database management system selection cannot be simplistic. In fact, the conversion to relational products today clearly demonstrates the consequences of oversimplifying product evaluations.

Fortunately, a good grasp of relational principles and SQL and their systematic application to product evaluation can help discipline the process.

The two major contributions of SQL are relational fidelity and standard compatibility. Fidelity combines reliable power with simplicity and thus provides the productivity that end users, application developers and system administrators badly need. Compatibility facilitates connectivity, portability and communication among platforms and users, which benefits both private and public institutions.

### Criteria

The problem is that practically all vendors claim their products are relational or support SQL. Is there any way to distinguish valid from unjustified claims?

First, a truly relational product must implement SQL genuinely, which means that set processing is native to the DBMS engine, or back end. A product whose architecture was not originally designed around SQL but has an SQL interface grafted on a one-record-at-a-time architecture will defeat relational productivity benefits.

Second, the SQL implementation must be complete. Completeness refers to the degree of fidelity to the 30 features of the relational model, supplemented by the now-famous 12 rules of Edgar Codd and compatibility with the de facto standard jointly set by ANSI and IBM. The relational model mandates structural (domains, tables, views, columns and keys), integrity (entity, referential and user-defined) and manipulation (nine relational operators and updatable views) features.

The 12 rules ensure that the model is properly implemented in accordance with the spirit, not just the letter, of relational intent. They mandate, implicitly or explicitly, set processing, a system catalog, data independence — and thus optimization — and systematic treatment of missing data or nulls.

The standard defines the syntactic form in which this functionality must be expressed: Data Definition Language, Data Manipulation Language, Data Control Language and transactions and recovery.

### An ideal world

Ideally, standard SQL should be fully relational and should provide a model for vendors to follow. Unfortunately, as set jointly by ANSI and IBM, the SQL standard trails behind the advances made by individual vendors and is likely to trail for the foreseeable future. Consequently, users must evaluate DBMSs on standard compatibility and extensions to it. The latter should not conflict with or deviate from relational intentions and should be weighed against the potential risk of divergence from future versions of the standard.

Keep in mind that the more relational products are still not fully relational but are closer to the model and are the only ones capable of adding the missing features. In fact, it is the precise purpose of an evaluation to screen out products without a genuine and as complete as possible SQL architecture.

Next week, I will conclude with a discussion of front-end tools, connectivity and portability.

---

Pascal is a Washington, D.C.-based independent analyst and consultant specializing in relational DBMSs and SQL on microcomputers and is affiliated with the Codd & Date Consulting Group.

## SOFT TIPS

## The carriage returns

If you need to convert a Microsoft Corp. Microsoft Word 4.0 document to one that has carriage returns at the end of every line, choose TTY as your printer, set margins at zero and print to a file.

*Information provided by Corporate Software, Inc., a Westwood, Mass.-based software reseller.*

# Fax board delivers message

BY JAMES A. MARTIN
CW STAFF

Smoke signals, carrier pigeons, airmail, overnight courier, ESP — there is more than one way to send an urgent message. The best method of all, however, may very well be a facsimile board and a personal computer.

Facsimile machines have marched into offices around the globe and in a few short years have become as common to businesses as a photocopying machine. But these machines are costly — usually more than $1,000 — and time-consuming. Typically, one must print a document from a PC, wait in line for the facsimile and feed each slow-moving page in sequence.

Vendors like Quadram Corp. and Gamma Link in Palo Alto, Calif., think they have a better solution. For instance, last year Quadram unveiled its JT Fax Board for the IBM Personal Computer and compatibles. Essentially, the add-in card and accompanying software turn the

*Continued on page 34*

**Quadram's JT Fax Board**

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# Minister chases Gerbil — back to the vendor

BY ALAN J. RYAN
CW STAFF

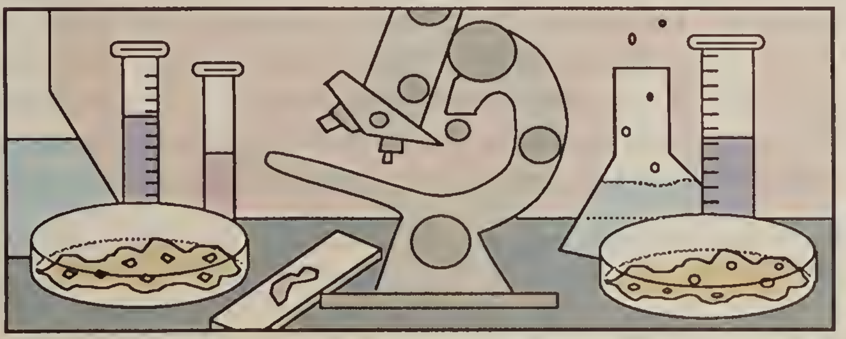
ASTON, Pa. — The Rev. Scott Cupp sat in front of his Tandy Corp. personal computer several weeks ago, working busily on a paper for one his doctoral-level classes. Suddenly, the PC locked up and Cupp saw the word "Gerbil.doc" in the corner of the screen along with strange-looking characters.

Cupp feared the worst. He thought he had been hit by a nasty computer virus. "I couldn't get the system to do anything. The whole thing locked up," Cupp said of his experience. "All I had was what was on my screen."

But days later — after many harsh words and losing a portion of his report — Cupp was told that Gerbil was the code name the developers at Software Publishing Corp. used when they developed PFS:First Choice, the package he was using for word processing.

Before he found that out, though, Cupp went through his other files and discovered the Gerbil.doc designation in them as well. He thought the virus had spread itself.

Using Peter Norton Computing's Norton Utilities, the minister "went into the section on Norton that allows you to go into ASCII files and erased them. I think I erased the access part of it," he said. All told, Cupp said, he lost several days worth of work.



**Careful study** *concluded a virus was not to blame*

### Mistaken identity

Gerbil likely wound up on Cupp's screen because he mistakenly opened up his First Choice document as an ASCII file rather than as a document from First Choice, explained Dale Yocum, Software Publishing's First Choice project manager. The characters Cupp saw were probably the random characters of a binary file.

In desperation, Cupp contacted RG Software Systems, Inc., which makes Disk Watcher — a product that helps protect against viruses. Ray Glath, president of the company, took a special interest in Cupp's case, and after making several calls, found out where Gerbil had come from.

Glath said the problem, which is not unique to First Choice, is that it allows both its own First Choice program files and other files, including communications device and printer files, to be brought into the word processor in the same way a user would bring in a document. A simple error could leave the user quite baffled, he said.

Due to the virus scare, Cupp's schoolwork was disrupted: "It threw me out of whack for about three weeks," he said. But fortunately, his professor was understanding. "He has a PC of his own."

# Rosenthal

FROM PAGE 33

cient exchange of the information needed for day-to-day operations and increased support quality, his answer was an enthusiastic yes. Asked if he would be willing to pay $100,000 for the software application and the necessary hardware required, he was equally positive: $100,000 was a trivial cost relative to the efficiencies the application would create.

It just so happens that that application could be developed using Lotus Notes, which is being written to work with OS/2.

Once OS/2 is described in terms of what benefits it can yield, it suddenly begins to make sense.

OS/2 is an enabling technology, meaning it provides many of the tools that make possible the kinds of applications that fundamentally make a task much easier for the people involved — the users.

Demand for OS/2 will simply not be driven by the user who wants to do stand-alone PC applications in a different way. Instead, it will be driven by the ability to handle different applications; those that have not been possible on the PC before or that have simply not existed because the tools haven't been there to build them. Some of these applications will be driven by connectivity; some will be driven by power; some will even be driven by the graphical user interface.

No MIS director or information center manager can afford to turn down those sorts of applications, regardless of the operating system they require or the cost of memory or new processors.

---

Rosenthal is chief executive officer and chairman of the board at Corporate Software, Inc., a supplier of PC software and value-added support services in Westwood, Mass.

# Fax board

FROM PAGE 33

PC into a facsimile machine so the user can send and receive files of text and graphics and print out the incoming file on a variety of printers. A 4.8K bit/sec. modem resides on-board.

The facsimile board concept is rapidly catching fire. According to International Data Corp. (IDC), a market research firm in Framingham, Mass., 1,200 facsimile boards were shipped in the U.S. in 1986; 16,555 units in 1987; and 49,600 units so far this year. By 1991, the figure is expected to be 187,440 units, according to IDC.

### Lookin' good

Quadram's entry is attractive for several reasons, users have said. The price — $395 — is less than most competitive models from vendors such as The Complete PC — the Complete Fax costs $499 — and the product is simple to use.

In addition, Quadram offers a portable facsimile board for $495 that can be attached to a laptop computer, enabling users to send and receive text and graphics files while on the road.

"I would be lost without it," said Michael Sussman, a PC product reviewer at Mnenatics Videotext. Sussman is handicapped and lives in remote Upper Black Eddy, Pa., surrounded by miles of farmland. "More companies seem to have facsimile capacity and they do E-mail or telex, so this allows me to get right to them using the files on my PC instead of having to print the file and scan it."

### Mixed reviews

Some reviews have criticized Quadram's board as too slow, but the speed is just fine for Paul Connell, an attorney at Kilpatrick & Cody in Atlanta.

Connell has a JT Fax Board on both his home and office PCs, enabling him to send documents to the firm's London office when he might otherwise be unable to.

Last winter, for example, a snow storm shut down Atlanta. "People in London don't care if Atlanta has an inch of snow," Connell said. "Because I had most of the document on a diskette I brought home, I was still able to get the document to London on time, despite the five- or six-hour time difference."

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## Barney

FROM PAGE 31

sounds a lot better than that!

If a long-time resister like Green has discovered SQL, the rest of the Dbase community is probably not far behind.

**Sorry guys.** "Third party" is a troublesome term. At least it got me into a jam. You see, in speaking with an upstanding member of the Dbase community, I was told that Ashton-Tate was holding a Dbase conference and no third parties were invited. That's where the trouble began. What this person was really referring to were third parties that also sell products such as language compilers, which replace the need for Dbase. He was talking about Ashton-Tate competitors.

So here's the real deal. Most third parties are cordially invited to attend the conference at the Century Plaza Hotel in Century City, Calif., from Sept. 13-16. And of those invited, only one has declined, sayeth Ashton-Tate. But those selling products that succeed by stealing Dbase sales still aren't welcome.

**PC prices, Part 2.** Last week, we ran an article about the end of that glorious era when PC prices fell often and fell a lot. But just because prices are stable today does not mean they will be stable tomorrow. Although there is some disagreement, analysts generally point to the easing of the dynamic random-access memory (DRAM) chip shortage and the advent of the lower cost Intel 80386SX chip as factors that may again push prices down — but when?

One theory is that the well-publicized 80386SX (a cheapo 32-bit chip with slow 16-bit data path) will create a domino effect. Cheaper Intel 80386 machines will drive down the cost of 286 machines, which in turn will cause 8088 prices to fall, says John Murphy, of Wohl Associates. "By fall, you will see some drops," he says.

Another theory is that 386 prices will stay put for a while. "Prices won't fall until Intel cross-licenses the 386 chip, and it doesn't look like they are going to," says John McCarthy, director of Professional Systems Service at Forrester Research in Cambridge, Mass.

But McCarthy has good news. He believes that once Microsoft and IBM's OS/2 begins to take hold later this year (he's an optimist), prices on machines unable to run the operating system effectively will fall.

A similar theory is espoused by Clare Fleig, director of research at International Technology Group. Fleig says there will be no major price cuts in the immediate future because of the continuing DRAM shortage. But in 18 to 24 months, when users really make the transition to 32-bit systems, prices on anything less will fall. Since prices won't be dropping any time soon, it makes sense to drive a hard bargain and squeeze those dealers till they hurt. That way they can really cry on the way to the bank.

Barney is a *Computerworld* senior editor, microcomputing.

## Northern

FROM PAGE 31

for a variety of tasks, including administration, time recording, billing and bookkeeping, said Olavi Ylanko, senior partner with Procope & Hornborg.

But the best may be yet to come. "We have under development a system for depositing our word processing documents into an archive, and we have a search facility to find our previous work," Ylanko explained.

The product, which took three years to write as part of a joint U.S.-Finish effort, supports peer-to-peer communications between workstations. It also supports C and boasts an extended C language object-oriented programming environment for complex interactive applications.

The system, which runs primarily under Microsoft Corp.'s MS-DOS, sells for $3,500 per server and $1,395 for the object-oriented development system. An OS/2 version is available and will be enhanced to run with IBM's LAN Server.

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# NEW PRODUCTS

## Development tools

**Computer Systems Advisors, Inc.** has announced a software development tool kit for the computer-aided software engineering marketplace.

Called **Picture-Oriented Software Engineering**, or POSE, the package is said to feature nine personal computer-based modules for planning, design and analysis of application software development.

The product can use either a data- or a process-driven approach and has an interface similar to that of the Apple Computer, Inc. Macintosh, the vendor said.

The nine available modules include the Data Model Diagrammer, the Data Model Normalizer, the Logical Database Designer and the Database Aid, as well as the Decomposition, Data Flow, Structure Chart and Action Chart Diagrammers.

The modules form an integrated set but can be purchased separately. The software runs on IBM Personal Computers, PC XTs and ATs, Personal System/2s and compatible systems.

POSE is available at an introductory price of $295 per module or $885 for a set of four data- or process-driven modules.

Computer Systems Advisors, 50 Tice Blvd., Woodcliff Lake, N.J. 07675. 201-391-6500.

## Systems

A family of microcomputer-based supervisory control systems for discrete operations in process and manufacturing plants has been announced by **Honeywell, Inc.**

Called the **Manufacturing Automation System/Controller** (MAS/C), the systems were designed to optimize cell- and supervisory-level automation operations, the vendor said. The units reportedly integrate plant floor devices with plant-level information management systems to provide a total picture of production activities.

Features include a multiple-window human interface with color screens and enhanced graphics, dynamic displays, function charts and pull-down menus. The product incorporates a proprietary manufacturing application control language and adheres to open system standards such as Manufacturing Automation Protocol, Ethernet, Unix and others.

MAS/C is available for shipment immediately and costs from $33,350 to $65,500, depending on system configuration.

Honeywell Industrial Automation Systems Division, Phoenix, Ariz. 85023. 602-863-5144.

## Software applications packages

Software designed for companies that provide technical support to their customers has been announced by **Tess, Inc.**

**Technical Support System**, or Tess, was designed for on-line technical support transactions and runs on Apple Computer, Inc.'s Macintosh, Macintosh SE and Macintosh II systems.

The package assists the technical-support process by providing an indexed customer-records database with attached free-form text records for tracking customer problems, the vendor said. It operates on a network of Macintoshes and can electronically mail support transactions across the network.

Tess costs $395 for the first user and $149 for each additional user on the network.

Tess, 21075 Bank Mill Lane, Saratoga, Calif. 95070. 408-741-1519.

**Advanced Business Microsystems, Inc.** has added an IBM and Microsoft Corp. OS/2 version to its Platinum series of accounting and management information system software.

According to the vendor, **OS/2 Platinum**, like its DOS counterpart, can support multiuser concurrent processing on local-area networks. Available application modules include Accounts Payable, Payroll, Accounts Receivable, General Ledger, Order Entry, Inventory, Fixed Assets, Spreadsheet Interface and others.

OS/2 Platinum modules cost from $595 to $1,995, depending on the application.

Advanced Business Microsystems, Suite 210, 19712 MacArthur Blvd., Irvine, Calif. 92714. 714-851-8722.

## Software utilities

**Stairway Software, Inc.** has introduced an add-in program for users of Micropro International Corp.'s Wordstar software.

Called **Screenextender**, the product reportedly manages the screen during Wordstar sessions to provide 25 rows and 80 columns of screen text. The number of rows and columns can be changed from Wordstar's opening menu or while editing a file, and as many as 58 rows of screen text can be selected.

The program works with IBM Personal Computer, PC XT, AT, Personal System/2 and compatible systems equipped with an IBM Color Graphics Adapter, Enhanced Graphics Adapter, Video Graphics Array or Hercules Computer Technology, Inc. graphics adapter.

Screenextender costs $59.95.

Stairway Software, Suite 204, 700 Harris St., Charlottesville, Va. 22901. 804-977-7770.

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DATA STREAM

*Patricia Keefe*

# LAN vs. mini still puzzles

Sometimes we get so caught up in the new and improved, we forget the ordinary users still stumbling over the dull edge of technology.

We all have this mental video clip of a razor-sharp Fortune 1,000, all grooving to a smartly appointed network strategy focused on network management and distributed applications.

While such may be the case for the Fortune 100 and perhaps even a good chunk of the Fortune 500, it just ain't so for the rest of the gang. Out of 33.9 million personal computers installed in U.S. businesses, only 18.33%, or roughly six million, are connected to local-area networks, according to an IDC analyst.

By 1992, IDC is projecting an installed base of 52 million PCs, 35 million of which will be connected to something. That tells me that during the next three years, the managers of some 29 million PCs will find themselves struggling to resolve an issue that many people thought had long since gone away: LANs vs. multiuser systems.

**Overwhelmed**

Users bemoan the dearth of information exploring the pros and cons of the two approaches. "I can't find any information anywhere," says a frustrated Velma Hart, who is trying to decide

*Continued on page 39*

# Twisted-pair link saves bucks

*San Francisco paper skips twin-axial for System/36 link, halves costs*

BY KATHY CHIN LEONG
CW STAFF

SAN FRANCISCO — West Coast media titan Chronicle Publishing Co. got the scoop on how to cut wiring costs by 50% after it opted to link its IBM Personal Computer workstations to its IBM System/36 minicomputer using twisted-pair cabling.

Chronicle Publishing is the holding company that produces the *San Francisco Chronicle* daily newspaper and runs a host of independent television stations.

The twisted-pair approach is unusual, since most users traditionally use twin-axial cable to link their workstations and terminals to the mid-range system.

The firm made the switch when the company moved to a new headquarters building last month. Although there are only 10 users on the network now, the company has wired the entire building in preparation for future growth, Chronicle MIS manager Dana Hom said.

The benefits of employing twisted-pair cable over twin-axial are multifold, according to Hom.

First, the cost per port was approximately $65 using twisted-pair, half the price of twin-axial medium. The wire itself is less costly and the installation is cheaper because twisted-pair is a thin medium and therefore easier to install. The costs would have been brought down even more had Chronicle decided to use a smaller contractor to install the cable, rather than Pacific Bell, Hom said.

Second, twisted-pair wiring eliminates the need to link devices to an IBM System/36 in daisy-chain fashion.

**The dark side**

The disadvantage of that configuration is that it requires taking all terminals on the chain off-line every time MIS wants to bring down one terminal. "In the old building, this caused us a lot of frustration," Hom said. "One time we weren't up for another three hours."

The change in the cabling medium did not affect the speed of the data. While IBM publishes speeds of up to 1M bit/sec., Hom said his benchmarks show that the effective throughput is 9.6K bit/sec.

Also, with the twisted-pair ring architecture, a workstation can be disconnected without affecting other users. Since there are eight wires on the twisted-pair and the System/36 Model D only uses two, Hom said the other six can be used for future applications.

He acknowledged, however, that the twisted-pair medium is not for all users. "This is unshielded and won't work well in noisy environments," he stressed.

Another limitation of twisted-pair cabling is that it allows workstation users to be only 1,000 ft away from the System/36, as compared with 5,000 ft on twin-axial cabling. Hom said the 10 finance and accounting users are in nearby offices.

# DEC, IBM praise EDI to the sky

BY KATHY CHIN LEONG
CW STAFF

SAN FRANCISCO — Archrivals Digital Equipment Corp. and IBM hardly agree on anything, but when it comes to the benefits of electronic data interchange (EDI), they are humming the same tune.

As users of EDI gear, both companies said they have reaped cost savings and faster turnaround time from EDI.

At a recent EDI conference here sponsored by market research firm Input, Bill Carlisle, DEC EDI electronic business document services marketing manager, and Bruce Jackson, IBM manager of EDI marketing, outlined their EDI experiences.

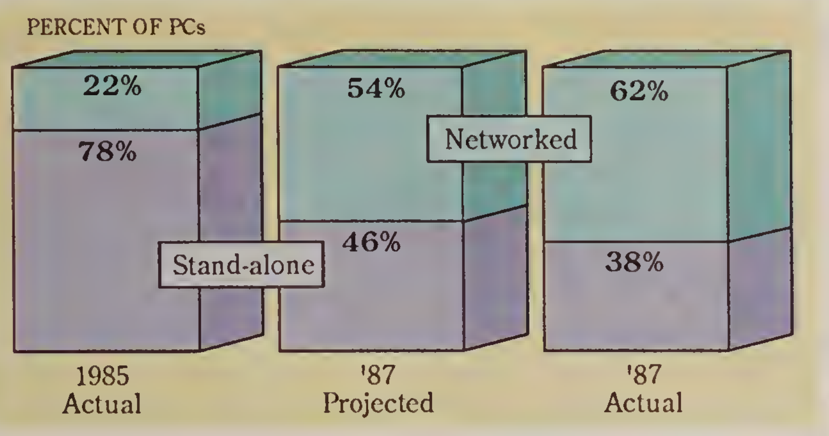
These advocates also have a vested interest in singing EDI's praises, as both supply EDI products. IBM sells EDI links into its

*Continued on page 38*

## Data View

Greater than expectations

*Last year, PC connectivity increased in popularity much more than forecasters had predicted*



INFORMATION PROVIDED BY INPUT
CW CHART

TIE-INS

# Rabbit cuts data deal

**Rabbit Software Corp.** in Malvern, Pa., recently completed an OEM agreement with **Ericsson Information Systems** in Stuttgart, West Germany, to supply data communications products to link Ericsson's Eritron microcomputer family with IBM's Systems Network Architecture environment.

**Datatel, Inc.** in Cherry Hill, N.J., has been awarded a contract valued at nearly $500,000 by the Miami-based Dade County Public School System for its DCP3800 Network Management System.

**Hyatt Corp.** recently inked a pact with **AT&T** and **Encore**

*Continued on page 38*

**Inside**

- Gateway designs LAN adapter card for PC AT. Page 40.
- Micom division has hardware/software Micro Channel controller. Page 40.

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# DEC, IBM

FROM PAGE 37

IBM Information Network [CW, May 2], and DEC recently introduced VAX/EDI, software the company said runs on a VAX supporting value-added networks in London.

### 'Absolutely critical'

Jackson called EDI "absolutely critical" to improving efficiency. "In three years, we want all 2,000 of our systems vendors to communicate to us via our VAN," Jackson said. IBM is also targeting 37 manufacturing plants and 80% of its communications requests.

Today, about 20%, or more than 200, of IBM's suppliers and customers are trading products through the Information Network. At IBM plants, shippers and suppliers communicate via the ANSI X.12 standard using applications such as purchase orders, shipping notices, invoices and electronic mail.

Using Information Network and X.12, customers can also tap into IBM databases to obtain technical and sales information or to submit orders for equipment.

EDI use has cut transaction costs while cutting turnaround time. Jackson declined to provide specific details on savings but noted they are comparable to those that DEC has experienced.

DEC's Carlisle claimed his company has reduced the cost of preparing a purchase order from $125 to less than $32 while paring the preparation time down from two weeks to three days. Also, the time for order acknowledgment has dropped from five weeks to three days, according to Carlisle.

Although DEC has no domestic EDI offering available, it has built its own X.12 software for internal use. Today, the company communicates with 35 trading partners via its EDI gateway in combination with both Telenet Corp. and GE Information Services value-added networks.

Four DEC sites use EDI formats for manufacturing, purchasing, financial, marketing, field service and distribution activities. The company said it makes more than 60,000 transactions per month using EDI protocols.

Like IBM, DEC's goals include using EDI for 80% of its purchase orders, invoices and payments by 1991. DEC also said it expects to cut the cost of purchasing transactions by 85% and cut or redeploy 30% of its procurement employees.

# Tie-ins

FROM PAGE 37

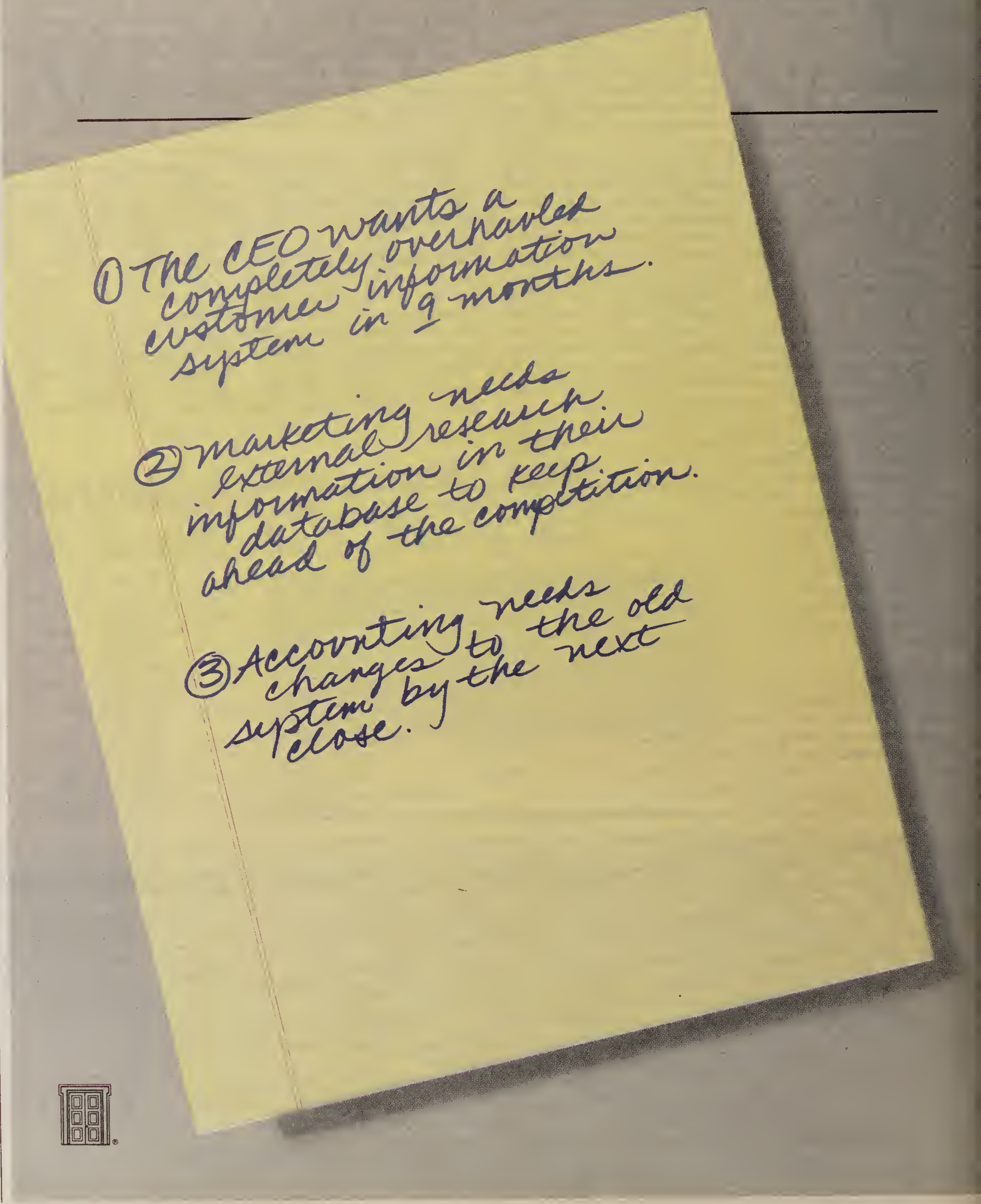
**Systems, Inc.** in Atlanta that reportedly will provide Hyatt hotels and resorts with a state-of-the-art guest reservation and registration system. The system is slated to include Encore's Property Management System and AT&T's Unix-based 3B2/600 and 700 minicomputers.

**The California Department of Water Resources** has agreed to purchase 92 System 9000 T1 multiplexers from **Digital Communications Associates, Inc.** The multiplexers will provide a high-speed backbone to connect 150 computer systems that monitor and control water distribution to two-thirds of the state of California, the agency said.

**Gould, Inc.** and **Cray Research, Inc.** have jointly developed a 100M byte/sec. communications link between their respective computers, which Gould will market as part of its Supercomputer Front-End Processor, or SuperFE. Called the IUO/HSX Communications Adapter, the link is said to provide point-to-point connections between Gould's NPL System Bus and Cray-2 and Cray X-MP and Y-MP Unicos systems. The SuperFE is available now.

**Fibronics International, Inc.** has signed what it claims is the first million-dollar contract to implement the Fiber Distributed Data Interface networking standard. The vendor signed an agreement to install the System Finex fiber-optic network to link computers supporting Italy's highway system.

How Would You Deal With These Problems?


① The CEO wants a completely overhauled customer information system in 9 months.
② marketing needs external research information in their database to keep ahead of the competition.
③ Accounting needs changes to the old system by the next close.

# Keefe

FROM PAGE 37

how best to accommodate a user population divided into 70% word processing and 30% dependent on access to a centralized processor. Her auditors have recommended a LAN, but her mini background has left her wary of LAN horrors.

Then there's Monica McLean. A vice-president of her county Data Processing Management Association group, she's also a computer systems coordinator for PCs at the State University of New York at Stony Brook. "I have PCs all over the place, and I'm at the point where I have to go to either a mini or a PC LAN."

What's even more confusing is when these users get double-talked by large systems vendors. Take IBM for example. To listen to the Token-Ring sales representative, you'd think minis were dead and buried. But then again, those IBM Application System/400 reps talk a good game of host access and FUD. "They really tell you different things," McLean says.

What to do, what to do?

Many consultants will rattle off this mini primer to a micro solution: "The advantage of PCs networked together makes a more effective approach than either a mini or mainframe solution," claims Doug Gold, an analyst at IDC.

PC LANS are lauded for cost cuts and productivity boosts. Attaching up to 10 users to a file server is much less expensive than a similar configuration involving a mid-range VAX from DEC, IDC's Gold claims.

The rise of powerful 32-bit workstations and the downsizing of host applications to the desktop has made it easier to apply PC solutions to what were once seen as minicomputer problems.

Other LAN advantages include software that users can share readily, a broader range of programs, the ease with which PCs can be moved, peripheral sharing and a plug-and-play approach.

Another consideration is development time and expertise. Rick Hopfer, a vice-president at Shearson Lehman Commercial Paper in New York, opted for a LAN over a mini to automate several departments. It's not only easier to find micro talent and to maneuver within the confines of micro programming, he says, but applications take less time to write, he says.

> TO LISTEN TO the Token-Ring sales representative, you'd think minis were dead and buried. But then again, those IBM Application System/400 reps talk a good game of host access and FUD.

A mini solution is good if the user is trying to protect a large investment in a specific brand of equipment, requires a lot of service and support or is tied to a specific application suite that may be tied to a specific hardware environment.

**Going out of style?**

Obviously, heavy users of record searches or database access tend to consider the power of a minicomputer. Undermining that rule is the emergence of dedicated database servers and distributed processing. "A year from now you won't need a mini to do centralized processing," predicts Tom White, an analyst at Infonetics.

He sees minis functioning as departmental information switches, while Gold expects to see more vendors positioning low-end minis as LAN servers within the next year.

Some users are already tacking mini servers onto their PC LANs. Lanworks, Inc., a Minneapolis-based systems integrator, is taking that route with a pilot for an 8,000-node government network. The mini functions as a computing server, processing large amounts of information quickly, says President Harvey Freeman.

---

Keefe is a *Computerworld* senior editor, networking.

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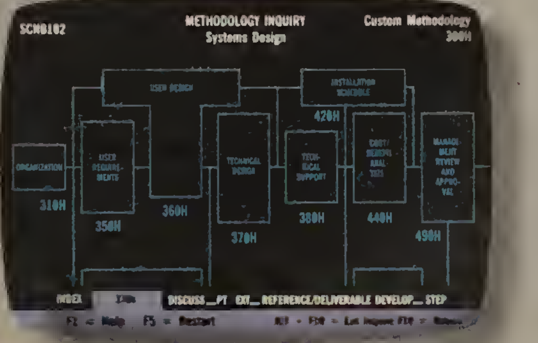

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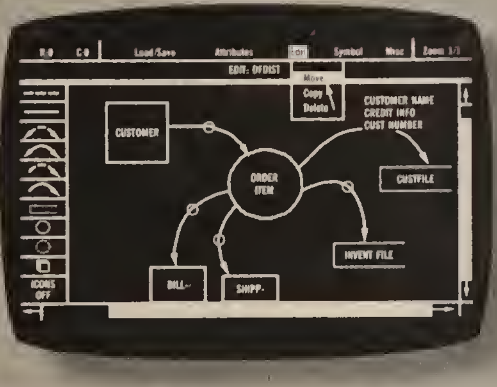

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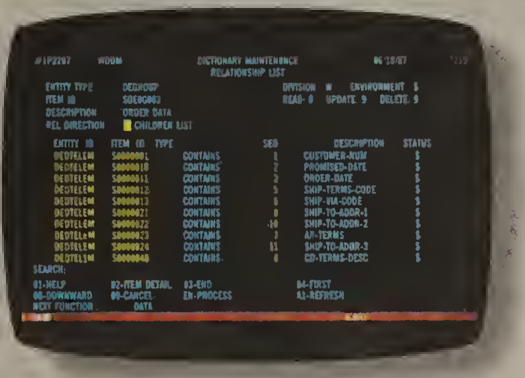

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# NEW PRODUCTS

## Local-area networking hardware

An Ethernet local-area network adapter card for the IBM Personal Computer AT and compatibles has been introduced by **Gateway Communications, Inc.**

Designated the **G/Ethernet 16-bit AT adapter**, the product is said to perform file server data transfers at rates of 1,066K byte/sec. and features 64K bytes of on-board random-access memory. The card is fully compliant with the IEEE 802.3 Ethernet standard specification.

The G/Ethernet 16-bit AT adapter costs $525.

Gateway Communications, 2941 Alton Ave., Irvine, Calif. 92714. 714-553-1555.

## Local-area networking software

A software package designed for personal computer communications has been released by **Allcom Computer Systems.**

The product, designated **Allcom**, is said to give microcomputer users several capabilities, including remote communications, control of remote printing and the ability to send and receive up to 30 files in parallel bidirectionally. According to the vendor, all these functions can be performed simultaneously. The product supports Xmodem and Kermit communication protocols.

Allcom costs $120.

Allcom, P.O. Box 3097, Santa Ana, Calif. 92073. 714-261-8191.

## Network management

The **Interlan division** of **Micom Systems, Inc.** has announced a combination hardware and software product for LAN Manager DOS workstations.

The **LM9210-OSI** is an IBM Micro Channel data-link controller that is combined with a host-based Open Systems Interconnect protocol to allow DOS workstations to communicate with an IBM and Microsoft Corp. OS/2 LAN Manager server.

The product offers either 16K or 64K bytes of dual-ported, on-board random-access memory and provides workstation support for Ethernet, thin Ethernet or unshielded twisted-pair media. An IBM Netbios virtual interface is provided at the transport layer for either LAN Manager functions or DOS.

The LM9210-OSI costs $595.

Micom Systems, 155 Swanson Road, Boxboro, Mass. 01719. 508-263-9929.

## Links

**Logicraft, Inc.** has released its latest version of **386Ware**, an Intel Corp. 80386-based DOS server that attaches to Ethernet to provide up to eight Digital Equipment Corp. VAX or Vaxstation users with access to personal computer software.

The package has been enhanced to provide increased support for the Vaxstation, allowing the system to display a full 25-line PC screen. Drivers are included for displaying static PC graphics with both the Regis and Sixel graphics standards, and a Vaxstation RX33 disk drive can be used for loading microcomputer software into the system.

386Ware for four concurrent users costs $9,995; an eight-concurrent user version costs $15,995.

Logicraft, 22 Cotton Road, Nashua, N.H. 03063. 603-880-0300.

**Relay Communications, Inc.** said it will ship an upgraded version of its micro-to-mainframe linking software early this month.

**Relay Gold 3.0** incorporates several major enhancements, including data compression and multiple session capabilities. The package reportedly will allow users to connect up to 15 simultaneous sessions and permits asynchronous communications through IBM 3270 emulation boards at the same time. Additional terminal emulations include IBM 3101 character and block modes, Digital Equipment Corp.'s VT-220 and VT-240, IBM 3278 Models 2, 3, 4 and 5 and IBM 3279 Models 2 and 3. The package runs on IBM Personal Computers and the Personal System/2.

Relay Gold 3.0 costs $295.

Relay Communications, 41 Kenosia Ave., Danbury, Conn. 06810. 800-847-3529.

## Modems/Multiplexers

A facsimile communications center said to integrate facsimile, telephone, answering machine and copier functions into one terminal has been introduced by **NEC America, Inc.**

Designated the **Nefax 3EX**, the multifunction unit incorporates a CCITT Group 3 terminal and a 9.6K bit/sec. fallback and step-up modem. The product offers transmission speeds up to 15 sec./page with identical units and up to 20 sec./page with other Group 3 units, according to NEC America.

The device measures 15.7 by 11 by 4.4 in. and weighs approximately 12 pounds.

The Nefax 3EX has a price tag of $2,395.

NEC America, Facsimile Division, 8 Old Sod Farm Road, Melville, N.Y. 11747. 800-782-7329

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MainLink II's half-card size means you can install it in any laptop PC—such as the Datavue® SNAP™—that accepts add-on boards. You can turn that PC into a truly portable terminal. The half card also saves precious space inside the case of desktop and "luggable" PCs.

FUTURE COMPATIBILITY

To assure continued compatibility, MainLink II's design allows for soft-loaded microcode. This means future features and enhancements can be added with just a diskette.

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|---|---|---|---|
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| IRMA Compatible | ● | ● | |
| IBM Compatible | ● | | ● |
| Soft Loaded Microcode | ● | ● | |
| Power on Self Test | ● | | |
| PC/XT/AT/PS2 Compatible | ● | ● | ● |
| 3174, 3274 Supported | ● | ● | ● |
| Emulation and IBM IND$ File Transfer | ● | ● | ● |
| Microchannel Available | ● | ● | ● |
| Price | *$545 | #$1,294 | +$1,020 |

* MLII-E $545.00, MLII-EM Micro Channel Version $645.00 MLII $395.00 - No Software, MLII-M $495.00 - No Software

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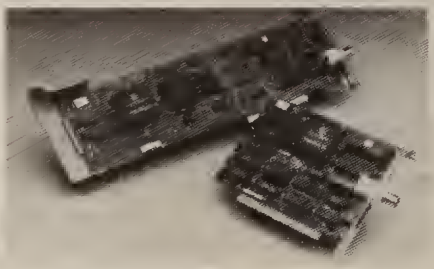

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**SPECIAL REPORT**

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- Penetrating the government
- The DEC connection
- Will dealers get left out?

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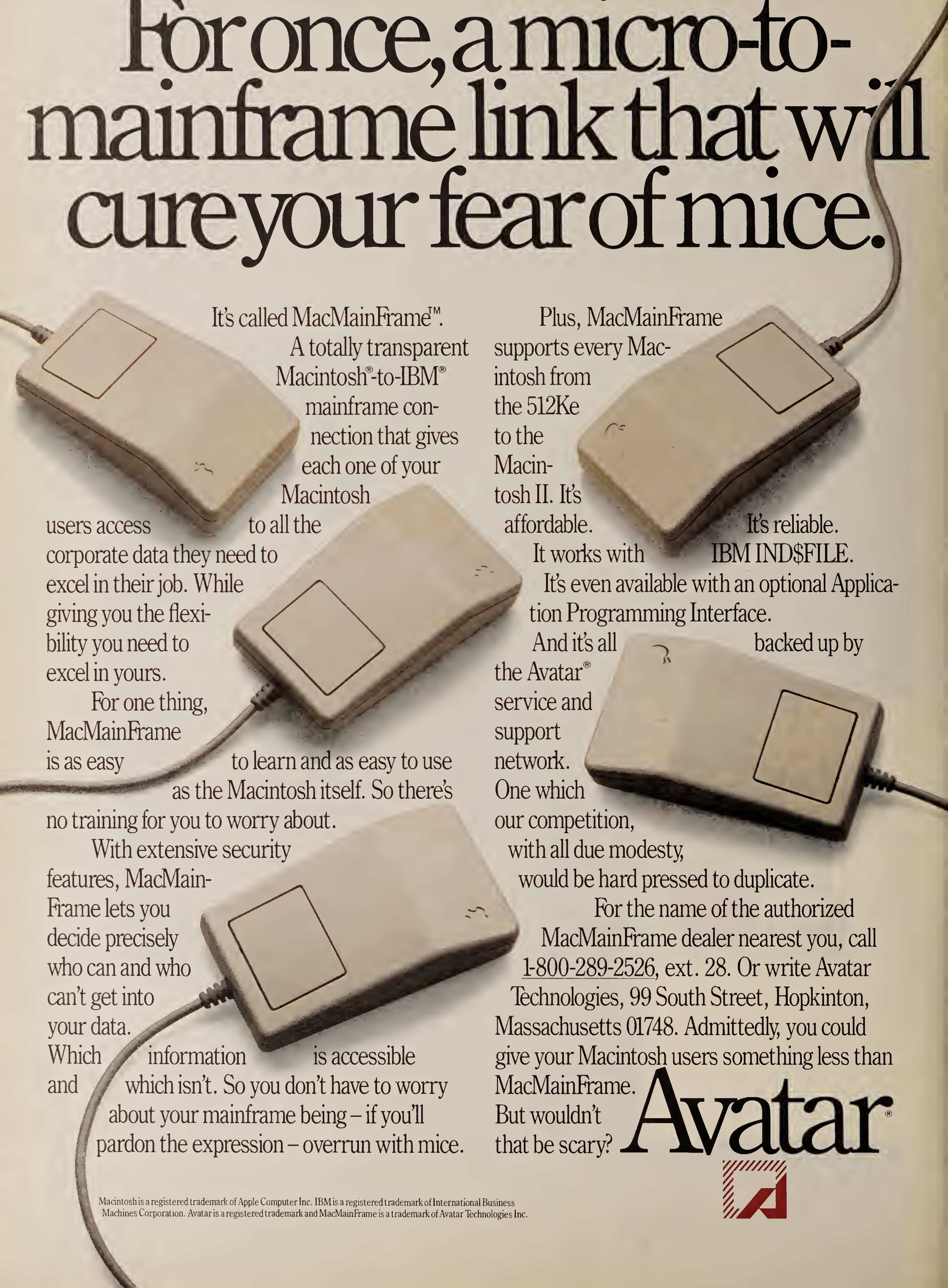

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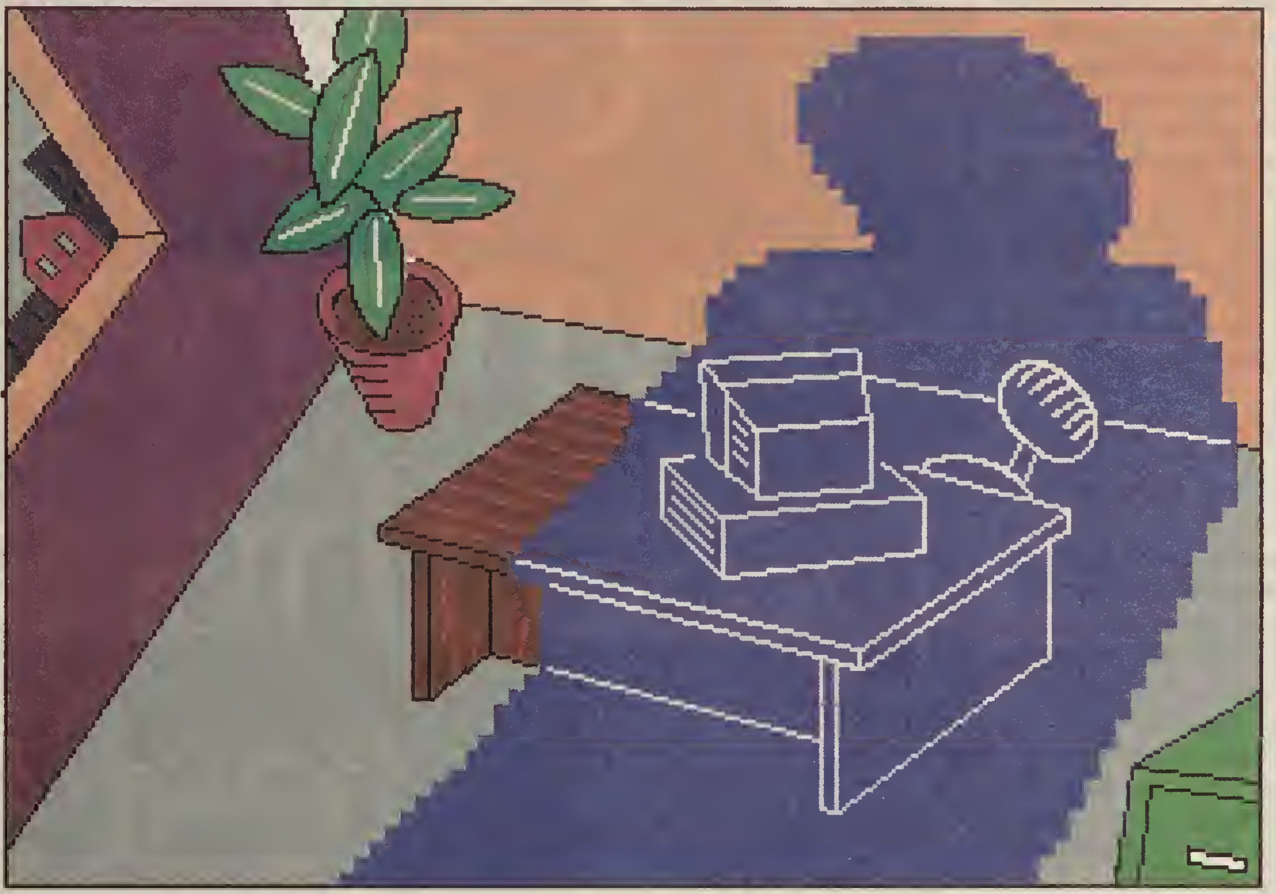
Edited by Glenn Rifkin

*Cover and inside art done on the Mac Plus by Scott Baldwin. Charts done on the Mac Plus and Mac II by Amy J. Swanson and Frank C. O'Connell.*

# Seeking Its Fortune

*Corporations take a shine to Apple, but Big Blue still dominates big business*



**BY JULIE PITTA**

Apple executives are fond of showing visitors a recent report from *Macintosh Business Review* listing the top 25 customers for the Macintosh computer. With prestigious names such as General Electric Co., Du Pont Co. and Federal Express Corp., the report is a showcase of Apple's remarkable progress in the four years since it first peddled the 128K-byte Mac to a largely disinterested group of corporate buyers.

However, a second look at the report offers a glimpse into the challenge that lies ahead in Apple's quest for respect from the Fortune 1,000. Among the 25 corporations listed, only four have purchased more Macintoshes than Microsoft Corp. MS-DOS-based systems. And two of those companies have special incentives to purchase Macintoshes exclusively — one is Apple's accountant, Arthur Young Co., and the other is its advertising agency, Batten Barton Durston & Osborne.

The bottom line: Apple has made big inroads in markets it created, such as desktop publishing and presentations. But it's still not the machine of choice in the Fortune 1,000 world.

"They need more testimonials from the big MIS guys that are using the Mac and connecting it," says Glen Miller, sales vice-president at computer equipment reseller Businessland, Inc.

Apple may be hitting the Big Blue barrier in its quest to sign Fortune 1,000 accounts. Corporate customers who are open to alternatives have likely already purchased their first Macintoshes, observers say. The rest promise to be a more stubborn sell, mainly because of a large installed base of IBM machines and their close relationship with that vendor. In a survey of 176 MIS managers on *Computerworld*'s Editorial Review Board, 71% said they had no plans to buy Macintoshes in the next 12 months.

That barrier looks even more formidable when you consider Apple's weaknesses. Chief among those are a lack of extensive connectivity tools

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Pitta is a *Computerworld* West Coast senior correspondent.

(see story page SR/6) and a failure to understand the components that make up a strong relationship between a corporate customer and its computer vendor (see story page SR/24).

And IBM isn't sleeping. Even Apple officials admit that IBM's Personal System/2 with OS/2 and Presentation Manager offers a serious challenge to the Mac's user-friendly technology — so serious, in fact, that Apple has filed suit against Microsoft, its largest third-party developer, and Microsoft licensee Hewlett-Packard Co.

Apple charges that Microsoft's Windows — on which Presentation Manager and HP's New Wave are based — infringes on the Mac's user interface. The suit is widely seen as an effort by Apple to stall development of those potentially competitive technologies.

**'Trojan horse'**

Apple officials insist that they don't expect to displace IBM on desk tops at large corporations. They say Apple will continue to work out the niches such as desktop publishing, which gained the company entry into a number of large corporations and which Chairman and Chief Executive Officer John Sculley has called Apple's "Trojan horse" into business.

"We're delighted with arriving at a position where we are 10% of the business market in a period of between three to four years," says Jerry Malec, a former IBM executive with 17 years of experience who recently joined Apple as vice-president of business marketing.

"Our goal is to grow from 10% to 20% over the next couple of years, which means we won't be the standard within these companies, but we will coexist with the standard," Malec adds.

But Apple is furiously playing catch-up with experienced business suppliers like IBM. Since January, it has introduced or championed third-party products to fill in its communications offerings.

And it continues to try to spruce up its image, adding experienced veterans like Malec, former Cigna Insurance Co. MIS executive Allen Loren and former IBMer Donald Casey as vice-president of networking and communications.

Perhaps Apple's greatest attention-getting tactic was its co-development deal with another IBM nemesis, Digital Equipment Corp., an announcement that kicked off 1988. So far, both parties have kept their public in suspense, offering few details on their development plans. An announcement is scheduled for this month at a joint developers' conference.

All that may not be enough.

"Apple hasn't really understood the big-company point of view," says consultant Amy Wohl, president of The Wohl Associations in Bala Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing." "They treat them at arm's length, telling them, 'You have to go through a dealer to buy Macintoshes. You need to go through this third party to get this kind of software.'

"Apple doesn't understand the relationship between an old-time IBM customer and IBM," Wohl continues. "Technology doesn't come between a relationship like that."

Its traditional insistence on dealer sales may be a weak spot with which Apple will have to deal in the short term. While the company stubbornly clings to its dealer-referral program, IBM typically flies its corporate customers to product briefings in a private jet.

> *"Apple hasn't really understood the big-company point of view. They treat them at arm's length."*
>
> AMY WOHL
> WOHL ASSOCIATES

Joe Vincent, director of technology planning at Humana, Inc., remembers a visit he made to the IBM facilities in Poughkeepsie, N.Y., about 18 months ago. An IBM jet picked up Vincent and a dozen Humana executives at Humana's headquarters in Louisville, Ky. The purpose of the trip was to offer Humana "a peek under the kimono" of IBM's future hardware and software plans.

Despite a long relationship with IBM, Humana is reviewing the Mac as a possible costandard with IBM within the company. Among the criteria Humana will consider are the Mac's ability to connect with the company's IBM mainframe and Personal Computers and its price/performance when compared with the PS/2.

"There is a substantial difference between selling to an individual and marketing to a corporation," says longtime Apple customer Timothy Turnpaugh, vice-president of MIS at Seafirst Bank, a Bankamerica Corp. subsidiary. "IBM has never been very successful in selling to the individual but has been hugely successful in selling to corporations.

"With Apple, it's the reverse," Turnpaugh continues. "A lot of big corporations are buying products from Apple, rather than Apple selling products to big corporations."

Can your async network pass this simple test?

Apple has added significant numbers to its sales force last year, Malec says, but the representatives are still expected to make the first call on a corporate customer, then refer the account to the appropriate dealer. Even a loyal customer like Turnpaugh — about 94% of Seafirst's PCs are Macintoshes — comments that Apple sales personnel don't always understand the needs of the corporate customer.

*Apple must resolve a long-standing dilemma: how to retain the loyalty of its dealer base while satisfying corporate customers who wish to buy directly from a vendor.*

**Looking for help**

Corporate customers aren't just looking for a source of equipment; they are seeking a partner to help them implement MIS solutions, he adds.

"You have to have guys who understand mainframe and networking problems — who understand everything from top to bottom," he says. "When you sell to a corporation, you aren't selling boxes; you're selling solutions."

Not only must Apple educate its sales force, it must resolve a long-standing dilemma: how to retain the loyalty of its dealer base responsible for Apple's early success while satisfying corporate customers who wish to buy equipment from a vendor directly.

Trav Waltrip, vice-president of telecommunications at Travelers Insurance Co., says his company has only six Macintoshes — used primarily for desktop publishing — out of a total of 20,000 PCs. Unless Apple decides to sell directly to Travelers, it is not likely to make any more sales there.

"Our relationship with IBM is not always warm and fuzzy, but it's close," Waltrip says. "It is very important to us that we deal with the vendor directly.

"We don't just buy workstations; that's only one component of our networking strategy," he continues. "A dealer just can't help us implement that."

Waltrip has a vocal supporter in Jeff Ehrlich, manager of computer technology at General Electric Co., Apple's largest corporate customer.

"Apple can't be beholden to a bunch of Mom-and-Pop dealers if it expects to be successful with corporations," Ehrlich contends. However, he adds, "Apple has sold a lot of products through dealers. This is a real dilemma."

**Don't look behind now**

Apple may have difficulty relying on its reputation as a leader in technology to sell Macintoshes now that the PS/2 has narrowed the gap. In the *Computerworld* survey, more than half said that PS/2 with OS/2 and Presentation Manager will cause them to buy fewer Macintoshes (see story page SR/9).

Charlie Oppenheimer, Macintosh group manager, concedes that the PS/2 package offers a serious challenge to Mac technology. He prefers, however, to downplay the threat it represents, repeating the new Apple credo: "We have it today."

"It will be years until you have the applications available on OS/2 and the Presentation Manager that are available today in the Mac environment," Oppenheimer maintains.

Apple says it hopes that IBM has created its own set of compatibility problems with the PS/2, which features a PC-incompatible bus, and its advanced but also incompatible operating system. "It's almost as though IBM shot itself in the foot," Humana's Vincent says. "Since the Mac offers a comparable environment to OS/2 and we can have it now, we'll be looking at it."

Apple is also telling corporate accounts that it has licked its communications problems, but its approach relies heavily on third-party vendors. Many users are taking a wait-and-see attitude.

"The heavy metal is where the data is," Turnpaugh explains. "You have to connect LANs to WANs, and you need to do it seamlessly."

**The first step**

Apple's current customers are heartened by what they say is Apple's recognition of its vulnerabilities. Apple realized the weakness in its connectivity offerings and has worked to rectify them. It is wrestling with the dealer sales vs. direct sales issue, and it has hired the industry heavyweights that have faced these types of problems before.

"Recognizing you have a problem — or opportunity — is 75% of the battle," Turnpaugh comments. "They understand that they need to understand us better."

Publicly, Apple has cast aside its usual bravado when discussing the enormity of the challenge that lies ahead. Oppenheimer concedes, "Just because you have the better mousetrap doesn't mean you have everyone on your doorstep." ■

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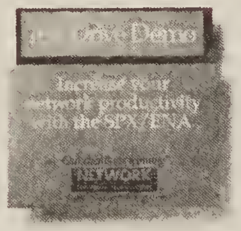

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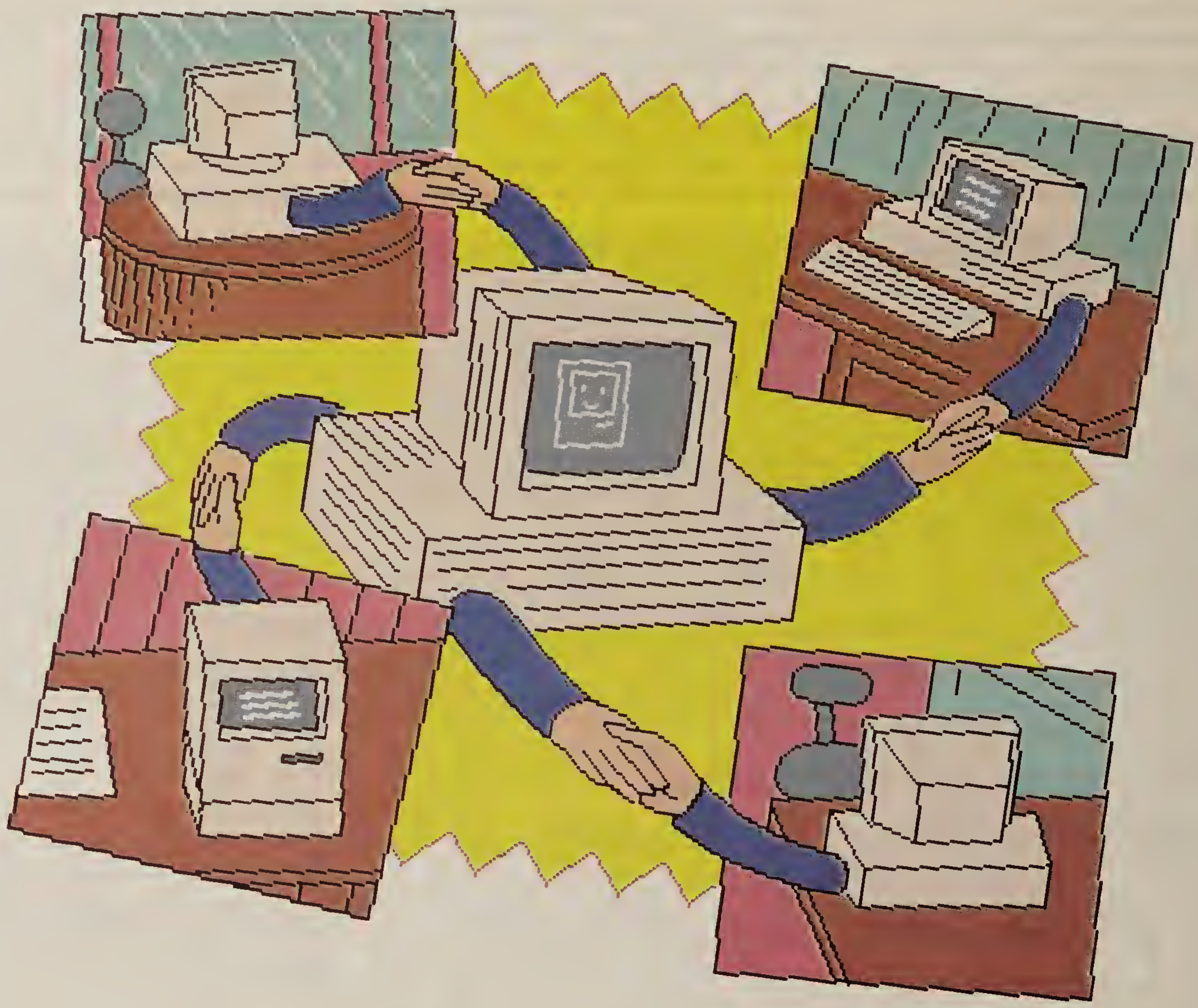
# APPLE LINKS UP



**BY PATRICIA KEEFE**

Apple has taken a painfully long time to learn that in the eyes of MIS directors, no computer is an island. But about a year ago, it began exhibiting concrete evidence that it has finally realized connectivity is its only passport to the inner sanctum of corporate data centers.

Once low on the totem pole of priorities, Apple's much maligned data communications strategy has finally gained status by functioning as the underpinning of Apple's "democratic desk top," a much-touted campaign to penetrate the Fortune 1,000 with Macintoshes by promoting user freedom of choice.

For Apple to achieve long-term and lucrative success in this arena, it also has to consider MIS's phobia about mainframe access. "Connectivity is absolutely key because MIS won't approve anything that won't talk to their environment," notes Tim Bajarin, an analyst at Creative Strategies Research International, Inc. in Santa Clara, Calif.

Once that reality hit home, the Cupertino, Calif.-based vendor lost little time making up for missed opportunities. The last 12 months have witnessed a blast of product announcements and technology purchases (see story page SR/7).

"In the past we were perceived to be behind in connectivity, and we want to correct that," says David Nagy, Apple's manager of IBM connectivity products.

Apple's message is that it will support industry standards to help MIS leverage its investments, but its added value will be to integrate those standards with the unique capabilities that the Mac offers.

Clearly, the message is starting to be heard. Apple claims it has one million active network nodes installed, while Dataquest, Inc., a San Jose, Calif.-based research firm, estimates that 38% of the installed base of Macintoshes are linked to a local-area network. And a 1987 survey by Framingham, Mass.-based International Data Corp. of 169,000 installations worldwide gives Appletalk, Apple's seven-layer architecture for connectivity, a 76.7% slab of the non-IBM-compatible personal computer LAN market.

Apple has tapped into the LAN market by beefing up its Appletalk platform with connections to faster topologies, primarily Ethernet, and has taken steps to prepare for the migration to IBM connectivity.

"Has Apple turned itself around in terms of communications? You bet!" says Bajarin, echoing the prevailing sentiment among Apple watchers.

*John Sculley has launched a relentless campaign to bring together the IBM and Apple worlds.*

To reinforce the message, Apple Chairman John Sculley has launched a relentless campaign to bring together the IBM and Apple worlds. Realizing that MIS would be happy with nothing less, Sculley has promised that Apple will match IBM's connectivity march step by step.

"Our strategy is to support IBM's Systems Network Architecture, which is found in most of our customers' environments," Sculley said in a speech given in January. "Our goal is to provide not only terminal emulation or PC-like functions, but also access to complete [IBM] office systems and distributed data processing functionality."

Apple's customers agree with Sculley's assessment. "Our strategy for the future is highly dependent on SNA," says Ron Simon, technical support supervisor at Applause in Woodland Hills, Calif. Simon has one 15-node Appletalk pilot, but his networking plans revolve around his IBM systems.

As far back as October 1985, Sculley conceded that "a lack of communications hampers the effectiveness of personal computers in organizations" and promised that Apple would implement the following IBM protocols and architectures: LU6.2 (with PU2.1), Token-Ring network, Systems Network Architecture Distribution Services, Netbios, Document Interchange Architecture, Document Content Architecture and Distributed Office Support System Library services.

But it was desktop publishing, rather than those soothing architectures and protocols, that have moved a fair number of Macintoshes into the Fortune 1,000. Most of these Macintoshes are either employed standalone or linked to Localtalk, the low-speed (230K bit/sec.), low-cost implementation of Appletalk, for peripheral-sharing purposes.

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Keefe is a *Computerworld* senior editor, networking.

What will spur connectivity between Macintoshes and IBM? "MIS wants us to build upon their investment in host databases," Nagy says. "They have all this stuff sitting there in IMS, DB2 or Oracle [databases] and they would like, through the Mac interface, to access it. But they are also saying, 'Show me how this fits into my organization, and how it will leverage investments I've already made in technology, personnel and training.' Getting to the management level is critical."

What is standing in the way of achieving this integration, observers say, is a significant laundry list: Token-Ring support, network management, support for Transmission Control Protocol/Internet Protocol (TCP/IP) and end-user applications that either set a standard in a particular area or that have companion packages in the IBM world.

### Porting encouraged

Analysts and users agree that it is imperative that Apple rally more IBM and Mac developers to port their products to the opposite environment. "Transparent applications make all the difference," maintains Mark Freund, a consultant at the Interconnect Group, Inc. in Pasadena, Calif.

Apple says it is moving to address the following complaints:

- **Token-ring card** — Nagy says Apple will announce the card in November, with delivery set for the first half of 1989.
- **Network management** — This is probably Apple's weakest area. "In all likelihood, we will implement Netview for the Mac, but that is a little bit farther out," Nagy says.
- **TCP/IP** — Apple has been promising TCP/IP support since December 1987 and is now slating fall delivery.

Also unclear is Apple's response to architectures looming on the horizon — IBM's Systems Application Architecture and the Open System Interconnect (OSI) model. Apple's efforts here will no doubt be bolstered by its purchases this year of SNA software developer Orion Network Systems, Inc. and Network Innovations Corp., developer of an SQL-based language.

## Apple's integration strategy

*Despite a tradition of going its own way, Apple clearly is embracing key IBM and industry standards*

| Target environment | Apple solutions | |
|---|---|---|
| | 1987 to 1988 | 1988 to 1990 |
| Microsoft's MS-DOS, OS/2 | Appletalk, third-party server networks | Appletalk, third-party server networks |
| IBM host | 3270/SNA | LU6.2/SNA |
| DEC's VMS | Appletalk, DEC's Decnet | Appletalk, OSI |
| Multivendor | TCP/IP | OSI, MAP, TOP |

INFORMATION PROVIDED BY APPLE COMPUTER, INC.'S *DESKTOP COMMUNICATIONS SOLUTIONS REFERENCE GUIDE*
CW CHART

Apple claims to be formulating its OSI strategy now, with help from Touch Communications, Inc., in which it has a minority investment. Touch has a Mac OSI developer's tool kit on the market.

Until recently, Apple relied for key areas of connectivity — file exchange and sharing, data extraction, protocol conversion, network servers, IBM 3270 or Digital Equipment Corp. VT100 emulation and Ethernet support — on third parties.

"The problem with Apple's strategy is that Apple is now competing with IBM and DEC," says Thomas White, president of Infonetics, Inc., market researchers in Santa Clara, Calif. "Do IBM and DEC let third parties solely set the trend for what users see? Apple should be setting the standard in all areas."

In response, Apple is now taking charge, defining protocols, setting standards, offering tool kits and end-user products such as MacAPPC, Macworkstation, Macterminal, Appleline and Appletalk PC. The new Apple wants to provide the lower level services and protocols and is encouraging third parties to target higher level areas such as commercial applications.

Also key is the Appletalk File Protocol (AFP), Apple's general-purpose network protocol that supports file sharing and other network services. Finalized in January 1987, the would-be standard has been a less-than-smashing success. Strongly supported in the DEC world, it lags in the IBM-compatible arena.

AFP recently picked up some much needed and significant support from Novell, Inc., the Provo, Utah-based vendor of the Netware network operating system. The Netware port to the Mac supports AFP.

"Apple sees two million Novell nodes and 1.5 million Macintoshes and its mouth starts to water," says Dennis Passavoy, executive vice-president of Datalan, Inc. a Los Angeles-based network reseller. At a joint press conference in June, Sculley went so far as to say Novell gave the Mac an entry point into the DOS and OS/2 world.

### Over-standardized?

Some third-party IBM-compatible network providers, such as 3Com Corp., do not support AFP. They maintain that the Fortune 1,000 is reluctant to support even one more proprietary standard.

But in those large accounts that have standardized on the Mac, users most certainly do care about AFP compliance, according to Rick Richardson, national director of technology development at Arthur Young in New York. The Big Eight accounting firm has thousands of Macintoshes in more than 90 nationwide offices. "You better believe I care about AFP," Richardson says. "I want to offer Mac users native file access to other resources; we never look for terminal emulators."

Still, support for AFP is expected to grow slowly, and to get onto corporate "buy" lists, Apple is going to have to do a lot more than don business suits, ordain protocols and spit out developer's kits.

Apple also has to win over mainframe programmers. It is no minor problem, notes Thomas Nolle, a consultant and principal at Haddonfield, N.J.-based CIMI Corp., that Apple uses different terminology to decribe its technology. "Many of Apple's terms mean nothing to a mainframe programmer," he says.

Apple has begun to bridge that cultural gap with Macworkstation, which essentially allows programmers to develop Mac-compatible applications from the comfort of mainframe terminology. But some rewriting of code is still required.

A second, possibly more important product, is MacAPPC, a tool kit co-developed by Orion and Apple, that implements LU6.2 and PU2.1 SNA protocols to allow the Mac to talk to IBM hardware. The point is to build on programmers' existing knowledge while minimizing culture shock.

Whether Apple can out-IBM IBM while retaining its unique capabilities remains to be seen. In the meantime, Apple must finish laying its connectivity foundations, generate some end-user applications to make all these pieces play and somehow package all these varied components into a cohesive, comprehensive communications platform. And, users say, it's all got to be transparent. ■

# Glossary: Apple's connectivity plans

These are the products or technologies that will have a major impact on Apple connectivity:

**Apple Communications Framework** — Guidelines and parameters that make up the communications architecture used in Apple's connectivity efforts.

**MacAPPC** — Apple's implementation of IBM's LU6.2 and PU2.1 Systems Network Architecture protocols. When coupled with a coprocessor board, software written using this developer's tool will link Mac applications with other Advanced Program-to-Program Communications (APPC) implementations running on computers such as IBM mainframes. The tool kit was slated to ship in July.

**Macworkstation** — A developer's tool that functions as an interface between the Macintosh and host-based applications and is targeted at mainframe programmers. It allows a Mac to be used as a front end to a host using a customized mainframe application while maintaining a graphical interface. It supports Appletalk, IBM 3270 terminals, Transmission Control Protocol/Internet Protocol, RS-232 and Apple's Communication Connections Language.

**Macterminal** — A multifunction terminal emulator that allows a Macintosh to emulate a Digital Equipment Corp. VT52 or VT100 terminalor an IBM 3278 Model 2 terminal.

**Appletalk** — Now called Localtalk, Appletalk is Apple's low-cost, easy-to-use, media-independent work group network. A $50 cabling kit attaches to the Appletalk connector that is built in to every Mac, allowing users to link Macintoshes and Apple Laserwriters into a network. The network is hobbled by an industry-low speed of 256K bit/sec..

**Appletalk File Protocols** (AFP) — An Apple protocol used for interprocess communications. Apple has had mixed success in trying to position AFP as an industry standard.

**Appleshare** — A dedicated file server for Localtalk networks. It is said to support files from multiple operating systems and provides printing and file sharing along with security and other network administrator services. Macintosh Pluses, SEs or IIs are also supported.

**Appleshare PC** — Combined with Appletalk PC cards, this server software provides Microsoft Corp. MS-DOS computers with access to an Appleshare server and Laserwriter printers.

**Ethertalk** — Developed by 3Com Corp. and sold under separate labels by Apple and 3Com, the Nubus-based card plugs into Macintosh IIs and supports connection to thin or thick Ethernet. The card works with Appleshare and 3Com's 3+ network operating system.

**Token-ring card** — The hardware is completed; software development continues. Based on the Macintosh Coprocessor Platform, the card targets the Mac II and uses a Motorola, Inc. 68000 processor and 512K bytes of random-access memory.

The final product is expected to support Novell, Inc.'s Netware for the Mac, 3270 emulation, APPC and the CCITT X.400 protocol while offering a choice of 4M- or 16M-bit speed. The cards are slated to ship by mid-1989. Pricing has not been set.

**3270/5250 card** — The combined terminal emulation board is scheduled for mid-1989 and will run in Mac IIs. The product reportedly will link to IBM's 370 mainframes and System/36 and 38 minicomputers, supporting IBM's 3270 High-Level Language Applications Programming Interface and coaxial and twisted-pair cabling.

**Appleline** — A terminal emulation and 3270 protocol conversion device used in conjunction with **Appleline 3270 File Transfer**, which transfers files between a 3270 mainframe environment and a Mac.

**Applefax** — Includes modem hardware; Resource software, which converts Macintosh files to Group 3 facsimile formats; Application Program, which lets users send and receive files; and the same fonts as Apple's Imagewriter LQ. Shipped in July, it costs $699.

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|---|---|---|
| Price<br>(5-year cost of ownership) | $199,138 | $441,000 |
| Performance | 5 tps | 5.7 tps |
| Fault tolerance | yes | no |
| Distributed relational databases | yes | no |
| Linear growth | yes | no |

Results of the standard debit-credit benchmark run by Tandem Computers and of the benchmark run by Digital.

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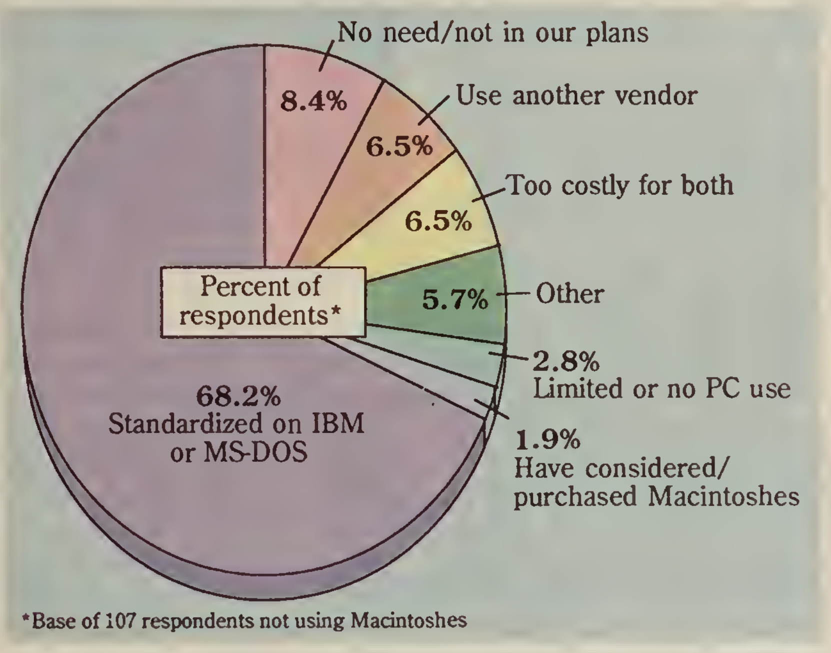
# An Apple a Day Still Not the Way with MIS Execs

**Seeing blue**

*Respondents cited incompatibility with the IBM standard as the main reason their organizations do not use Macintoshes*



*Base of 107 respondents not using Macintoshes

INFORMATION PROVIDED BY CW PUBLISHING, INC.
CW CHART

Despite Apple's heightened efforts to break into the Fortune 500 commercial accounts, MIS managers remain unenthusiastic about the Macintosh. According to an exclusive survey of 174 MIS executives who are members of *Computerworld*'s Editorial Review Board, only 37% have Macintoshes in their organizations, and just 29% plan to purchase Macintoshes in the next 12 months.

More critical to Apple, however, is the finding that 54% indicated that the coming graphical interface programs, such as Windows and Presentation Manager for IBM's Personal System/2s, will cause their companies to purchase fewer Macintoshes.

The survey supports the view that MIS remains committed to IBM Personal Computers or compatible machines as the corporate choice. When asked why their organization was presently not using Macintoshes, 68% responded that their company had standardized on IBM exclusively, Microsoft Corp.'s MS-DOS or IBM compatibles.

Also reflecting current industry opinion, 60% of those responding who do have Macintoshes said they were purchased for desktop publishing, while 57% purchased Macintoshes for ease of use.

Since MIS continues to hold sway in corporate microcomputer buying decisions, Apple must find a way into this traditionally IBM bastion. Although 70% of the requests for Macintoshes were initiated by end users, MIS controlled the approval process in 65% of the organizations polled.

A key ingredient, according to the survey, is the ability to network Macintoshes into the mainstream computing environment within the company. Approximately 61% of the respondents pointed out that network capabilities are either important or extremely important requirements for the Mac.

Forty-five percent were currently using Appletalk as the Mac network of choice. Nine percent said they are tied into DEC networks; an equal number said they are tied into IBM networks. ■

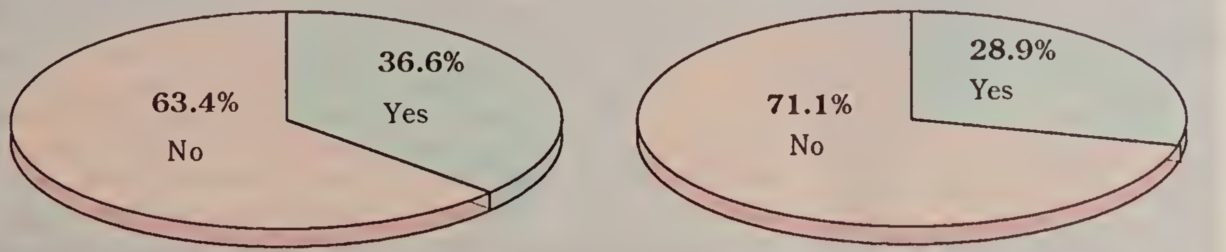
**Hard sell**

*Plans to buy Macintoshes have hit a plateau in subscriber organizations*

PERCENT OF RESPONDENTS (BASE OF 173)

"Does your organization currently have Macintoshes in use?"

"Does your company plan to buy Macintoshes within the next 12 months?"



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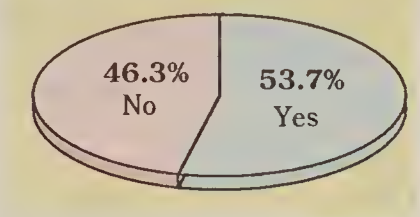
**Like being in pictures**

PERCENT OF RESPONDENTS (BASE OF 108)

"Do you feel that graphical-user interface programs, once entrenched on PS/2s, will cause your company to buy fewer Macintoshes?"



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# MAC II VS. MODEL 70: A COMPARISON

**BY CHARLES BERMANT**

Like two Olympic runners in the home stretch of a race, Apple and IBM stay in top PC form by constantly forcing the other to look over its shoulder.

Battle lines are now drawn with IBM's recently announced Personal System/2 Model 70 and the Apple Macintosh II, released last year. Before the Model 70, the Mac was somewhat awkwardly positioned against IBM's only other Intel Corp. 80386-based machine, the PS/2 Model 80. This is still an option. The Model 80 is a better network server, but the Model 70, with its svelte design and burn-down-the-bushes clock speed, will be the machine against which the Mac II will now be directly compared.

IBM has weathered criticism for the lack of a cutting-edge product and its unwillingness to push the envelope of available technology. For instance, the first PS/2 Model 50 locked users into a hard disk that was slower than the recommended standard for use with the Intel 80286 chip. It's not known what fine-tuning, if any, the Model 70 will require, but suspicions are that it will silence most naysayers. It is decidedly not a first-draft machine but a competent, full-featured personal computer that represents the maturing of the PS/2 line. To borrow a compatible homily, if you can find a better Microsoft Corp. MS-DOS single-user machine from another vendor, you should buy it without hesitation.

That the Mac's strengths are weighed against IBM's offerings proves that Apple's claim to a higher corporate profile is no idle boast. That the Mac currently can outperform its competitor's latest offering surprises IBM partisans and, in fact, shakes the foundation of that loyalty.

Both companies bristle at the suggestion of a head-to-head match between these two machines; they say it is an unfair comparison of apples and blueberries. The Model 70 runs existing DOS applications at unprecedented speed but is intended to be a platform for OS/2 and its graphical user interface, Presentation Manager.

**IBM's** *PS/2 Model 70*

**Apple's** *Macintosh II*

OS/2 proponents say it will offer far more than the Mac; Presentation Manager will be a priority-driven multitasking operating system, whereas Multifinder — Macintosh's multitasking facility — is only a task switcher. Apple does not dispute this point but says that the Mac gives users all the multitasking ability they need.

Apple disciples say they feel the comparisons are unfair for the same reasons — equal systems are not yet available — but draw different conclusions. The Macintosh and its graphically based operating system are in full working order today, and there is no reason to wait the expected 18 months for IBM's Presentation Manager to gain critical software mass.

While certain aspects of the hardware can be measured directly, the machines are best judged by the software that supports them. For users, what each machine can do should drive the buying decision.

While the Model 70 and the Macintosh II are available in a variety of configurations, they are comparably priced. Including disk drive, video, memory or communications options, the machines can cost from $6,000 to $12,000 apiece. The Mac II does not emulate the ET-like visage of its sister products and is several inches wider than the Model 70. Both machines fit comfortably on a desk top, with the monitor perched directly on the system unit in traditional PC style.

> *What each machine can do should drive the buying decision.*

For their respective power, both use the most sophisticated processors now available — Apple's Motorola, Inc.-based 68020 and IBM's Intel-based 80386. Both use 3½-in. floppy disk drives; the same physical disks can be used on both but must be formatted to suit the respective systems. The Mac's base unit has no fixed disk, but a 40M-byte drive will be the minimum most users will need. IBM does not sell the Model 70 in a floppy-only version; rather, the "bottom-of-the-line" unit already has a 60M-byte, 27-msec fixed disk installed. Processor speed on the Mac is fixed at 16 MHz, while the PS/2 Model 70 will be available in 16-, 20-, and 25-MHz versions. A faster processor in and of itself is a slight

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Bermant is a San Jose, Calif.-based free-lance writer.

advantage but not a radical one.

Each machine has a proprietary system architecture governing its expansion cards — Nubus for the Mac and Micro Channel for IBM — and both were designed to facilitate data transfer. Support for both systems by third parties is currently anemic at best but will certainly expand during the next few months.

The Mac arrives with 1M byte of random-access memory, expandable to 8M bytes. At 2M bytes, the Model 70's RAM standard is IBM's highest with an upper limit of 16M bytes. Both machines work with the lower RAM levels, but most applications will eventually demand more. Apple "power users" cite 5M bytes as a comfortable limit, while the OS/2 requirement is understandably more elusive. Estimates vary, but IBM's own recommendation for optimum OS/2 RAM is between 3M and 4M bytes.

IBM hardware has always been open by nature — although the PS/2 is hardly considered open — while the Mac is proprietary. For that reason, there are no Macintosh clones. This has given Apple another advantage: 286-based coprocessor boards can fit into the Mac with the ability to both run DOS software and incorporate it into the Mac environment. A single-machine/dual-software environment solution can thus only be a Mac.

The Mac II is itself expandable, featuring six slots — one of which is required for a video interface. The Model 70 boasts three, but the video, along with parallel (printer) and serial (communications) inputs are built into the motherboard. The Mac, then, has one more net slot than the Model 70. Both machines have mouse and keyboard ports on the rear panel, although the Mac allows the mouse to plug directly into the keyboard and daisy-chain with other input devices.

### Getting graphic

Both IBM's Video Graphics Array (VGA) and Apple's graphics standard are analog environments with the potential to display an infinite number of colors. Model 70 users are almost locked into VGA; other graphics systems can be installed, but that means sacrificing a valuable expansion slot and essentially not using something that has been paid for. Again, VGA cannot be judged for what it is today, as most software support is forthcoming.

Apple's red-green-blue monitor, a customized Sony Trinitron, has an inch more of screen space than the IBM 8513. It captures less glare and its colors take on a depth and a sheen the IBM machine lacks. With the range of options available, a monitor becomes the system's wild card. But Apple's standard monitor — for many the default purchase — will satisfy those who do not seek a large-screen solution. IBM buyers, many of whom will probably select the 8513 on its own merits, should still investigate comparably priced third-party options.

Video power boils down to software issues, with Mac graphics programs currently more plentiful and easy to use. Desktop publishing, the application that for many users makes graphics practical, is possible on the PS/2 Model 70 but is one area in which the Mac has a hands-down advantage.

Some corporate trainers estimate 100 hours are needed to gain DOS proficiency; Presentation Manager is expected to cut that time considerably. Still, it's not hard to get to a productive level on a PS/2, although many users don't bother to learn the subtleties of the system.

Macintosh users, however, find that if they master one program, they can use virtually all of them. After learning Dbase Mac, Wordperfect will be a snap. The same is not true for the program's Model 70 counterparts. Mac commands are hard-coded across the top of the screen; all programs derive commands from pull-down menus. With the mouse-driven hand-eye combination, using a Mac becomes an intuitive process. It is here that the sharpest difference between the Mac II and the Model 70 emerges.

On a hardware level, the machines are arguably equal. The Macintosh software environment has a continuity now lacking in the PC world that results in a marked advantage in ease of use. Presentation Manager aims to eventually achieve a similar unity. While IBM users see this evolution as welcome and something that will effectively designate the arcane DOS command structure to the trash heap, Mac fans have little sympathy or patience. Presentation Manager, they feel, will only be a clunkier version of what the Mac already offers.

With the Mac's consistency comes a certain rigidity, as it can only run programs specifically written for its interface. If the Model 70 is "clunkier," it is also more flexible, incorporating OS/2 potential while maintaining DOS abilities. While users are waiting for OS/2 to gain steam — or if it fails to reach its potential — the Model 70 can use the current software platform to its best advantage.

The choice between the two machines will only be easy for those who compute in a vacuum. For ease of learning, software continuity and sheer visual power, the Macintosh quickly and obviously emerges as the best choice. But corporations, places where IBM has established considerable strength, are not vacuums. And Apple's corporate gains come not so much from an embrace of the hardware but from an acceptance of some of the Mac's concepts. IBM, consequently, may determine what aspects of the Apple charter its customers desire and offer its own alternative or work-alike solutions. This competition's ultimate result is machines of unprecedented power and scope on the desk top today. While Apple and IBM battle, the user wins. ■

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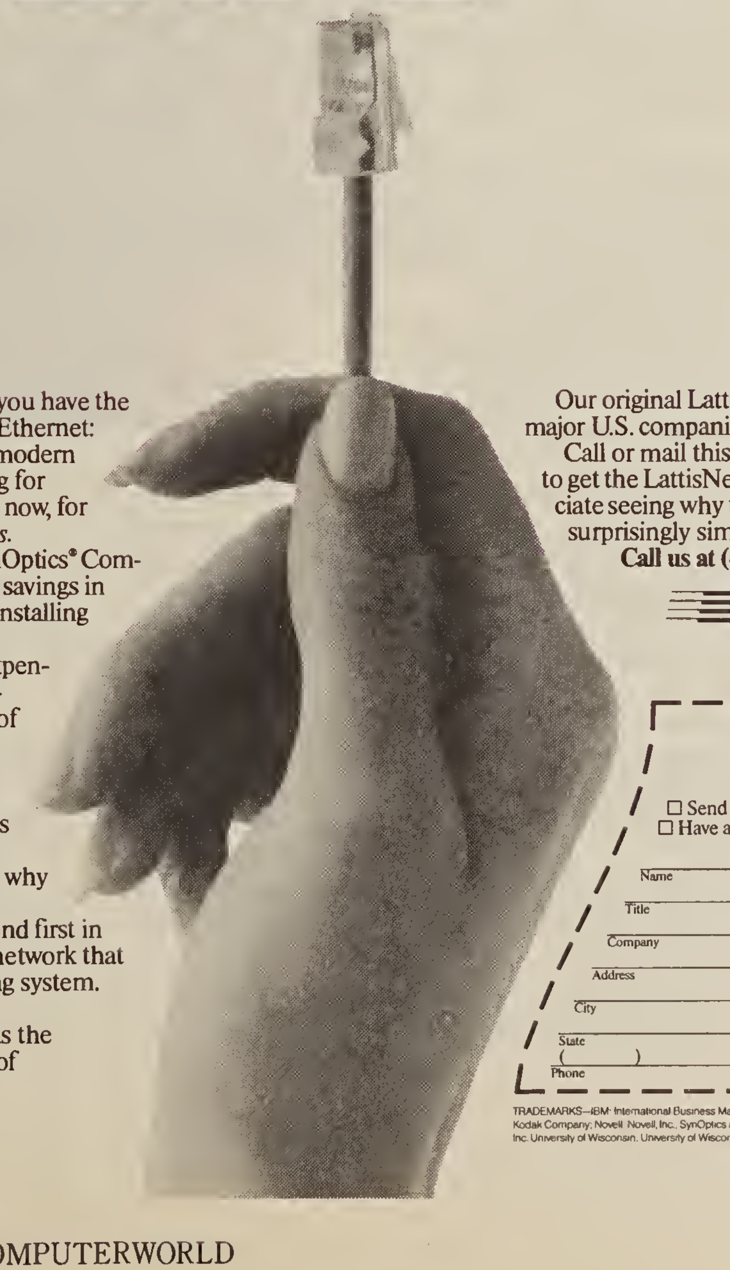

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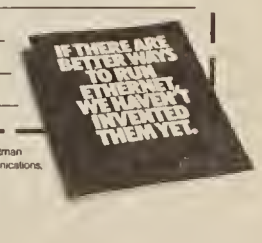
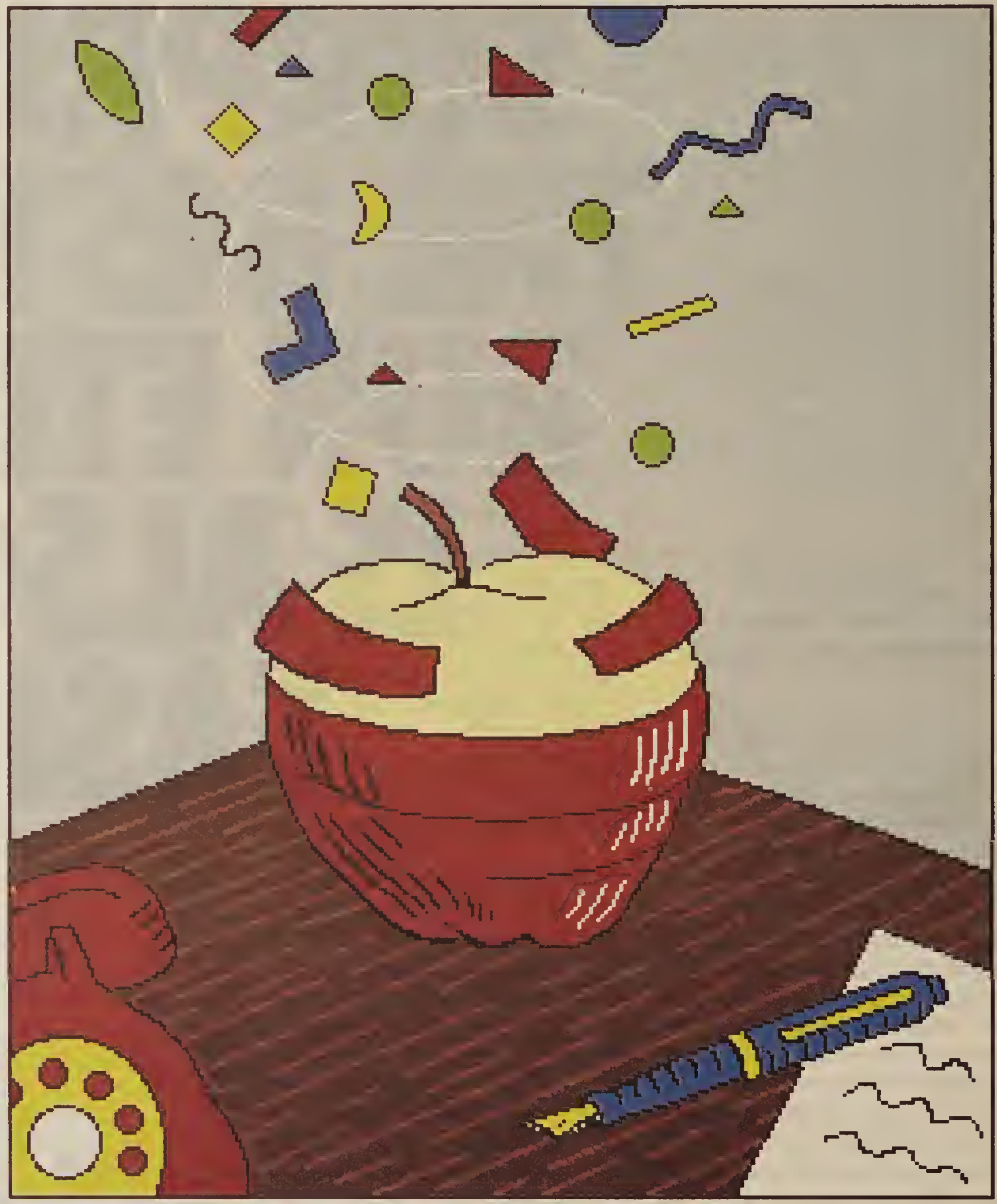

IF THERE ARE BETTER WAYS TO RUN ETHERNET, WE HAVEN'T INVENTED THEM YET.

# Is Innovation Still at Apple's Core?

**BY PAUL FREIBERGER and DAN MCNEILL**



Apple is at a crossroads. For years, it has played the hare to IBM's tortoise, and its quickness has given it a technological edge and allowed it to prosper. But today its lead is waning. With IBM's Personal System/2 line, other 32-bit machines and the spread of the Macintosh interface, competitors are closing in. The big question hanging over Apple is: Can it spurt ahead technologically once again?

There are signs Apple is worried about its slipping edge. Its recent lawsuit against Microsoft Corp. and Hewlett-Packard Co. is a clear attempt to prevent grafting of the Macintosh framework onto the PS/2 and suggests that the 4-year-old interface remains vital to company plans.

"The wave Apple is currently riding has crested so high because of the visionary thinking of Steve Jobs, which appeared in the Macintosh and the Laserwriter," says Brian Mutert of Stratagem, a software consulting firm in San Francisco. "Many of those people are gone. That, coupled with the fact that Apple is becoming more, not less, concerned about holding onto its technology designs, causes concern about their ability to run forward and come up with the next generation of technology."

Though proud of their accomplishments to date, those within Apple realize the challenge. "We stake our future on Apple's ability to differentiate its platform," says John Zeisler, vice-president of marketing.

The Apple keynote has always been credible innovation. Despite such noted failures as the Lisa and the Apple III, the company has generally displayed a good sense of timing. It offers budding technology just when it is ready for general use, thereby legitimizing it. With its combination of market savvy and technical flair, Apple is following a two-pronged strategy for the future: Exploit the lucrative Macintosh to the hilt and cast about for innovations to perfect, introduce and legitimize.

The first approach is something of a holding action. The Macintosh earns tremendous profits — the company recently reported a net income jump of 71% for the fiscal third quarter — and Apple wants to press the advantage home. Eric Winn, an independent Silicon Valley marketing consultant, estimates that Apple receives 72% gross profit on every Macintosh SE it sells to dealers. The company ended its second quarter sitting on $611 million in cash with virtually no debt.

Apple is advancing along a number of fronts. It is expanding and diversifying its Macintosh line. It also has a Unix workstation. Al-

*After the departure of Steve Jobs, some are concerned that Apple won't be able to differentiate its platform enough to ride the high-tech wave into the future*

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Freiberger is a business writer at *The San Francisco Examiner.* McNeill is the author of several books about computers and is based in Southern California.

though the software is not yet in final form, the Unix system is currently available. And Apple is preparing to release a Motorola, Inc. 68030-based Mac and a laptop Mac around the end of this year. It is also upgrading its operating system — offering true multitasking, enhancing its screen display, linking the Mac with office mainframes and minis and enhancing communication among programs.

The main task is diversifying the line. Apple's wedge into corporations is the Mac II, but is it enough? "I think Apple has only one product well suited to Fortune 1,000 accounts, and that's the Mac II," says Bruce Lupatkin, an analyst at Hambrecht & Quist, Inc. in San Francisco. "They need to hurry up and have some complementary offerings. One is a 68030 Mac and one is a laptop Mac."

Reports indicate the 68030-based computer will be a floor-standing as opposed to a desktop machine, designed to compete directly with IBM's most powerful PS/2s. The device will support at least six users through Apple Desktop Bus connections. It will include read-only memory-based Ethernet support and a built-in Ethernet connector. The machine could also have a built-in 500M-byte write-once read-many drive, though this enhancement may be available as an option.

*Not everyone finds the spectacle of professionals conversing with cartoon figures enchanting.*

In addition, it will offer true multitasking. "They need to evolve into a full multitasking operating system," says William Shattuck, an analyst at Montgomery Securities in San Francisco. Observers note that Apple started with Switcher, software that allowed programs to be moved in and out of memory foreground and background, which has been improved on with Apple's Multi-Finder. But complete multitasking is becoming essential.

## Wish list

"We need full multitasking," says Tom Lafleur, director of engineering at Qualcomm, Inc., a satellite communications firm in San Diego. Lafleur makes system purchasing decisions for his company and has already bought hundreds of Macintoshes. He says multitasking will assist him by allowing for concurrent use of software development and electronic mail programs.

Richard Shaffer, editor of the newsletter "Technologic Computer Letter," adds, "If they're going to go at the workstation market, they need a better multitasking operating system. They've said they'll do a rewrite of the operating system. They need to do it."

The 68030-based machine could debut as early as this October, but plans are uncertain, and the limited availability of components for the 68030 may push the date into 1989.

## Laptop ahead?

The company, according to recent reports, is also developing a laptop Macintosh. The laptop will have Motorola's 16-MHz 68HC000 CPU, three chips specific to applications, an active-matrix screen, a track ball, an eight-hour battery, a 20M- or 40M-byte hard disk and perhaps a 1.44M-byte disk drive. It, too, is expected to appear this fall or early next year. The laptop may not be a major product, but it could occupy a valuable niche. And offering Mac capabilities on a laptop gives Apple another technology edge.

Apple wants to promote the Mac II as a workstation, and to that end it is developing its own version of Unix, called A/UX, which boasts a Macintosh "look and feel." The firm introduced it last year, selling a version of the Mac II with A/UX. But it is not seen becoming a mainstream product until more features important to workstation users are added to A/UX. Unix is a formidable operating system, and Apple wants to cover the flank where Sun Microsystems, Inc. lies with its own Unix workstation.

Apple is pushing the Mac through a variety of other means, including software and peripherals. Perhaps the most interesting is Hypercard — the stunning graphical database and programming tool. Introduced to the kind of oohs and aahs that normally greet fireworks, Hypercard has so far remained rather dormant. It could stay just a brilliant toy or evolve into a dominant and influential interface — a new standard.

"Nobody here uses it," says Qualcomm's Lafleur. "It just takes time for someone to get into it and write applications. I think it's going to take more time to develop."

"It's a very useful tool, but there is a significant learning curve to figuring out how to use it," notes Lupatkin, adding that Hypercard alone is not yet leading corporate users to buy Macintoshes. "Yet Apple is basically a technology trailblazer, and sometimes it takes a while for the world to follow suit. That was true with the Mac and the graphic interface."

Apple is also investigating interprocess communication, called cooperative processing, which involves the automatic transfer of data from one program to another. "For instance, if you're running a stock retrieval program in one window and a spreadsheet in another, when the stock retrieval was updated, it would automatically update the spreadsheet" and any other programs that depended on this data, Lupatkin says.

Apple has also announced to developers that its fall upgrade of the Mac operating system will probably include an interapplication facility, or IAC. IAC resembles Hot Links in Lotus Development Corp.'s Modern Jazz and offers a way for programs to swap information without dealing with low-level protocols.

Also critical is display technology. The Macintosh screen achieved its crisp what-you-see-is-what-you-get resolution at the expense of size, and users have long complained about tunnel vision in their work. As Stratagem's Mutert notes, "Apple has got to find a way to put larger screens in every Macintosh. People trying to work within the confines of the Mac SE monitor are suffering a severe productivity penalty." Apple is almost certainly following this advice.

The second avenue to innovation is that of the internal visionaries, who view Apple as a company with a time-hallowed mandate to bring slick, easy-to-use computers into the home and office. Jobs was noted for pushing Apple into new technological areas, and the company still has some of the leading computer scientists in the industry, including Alan Kay and Larry Tessler. Their mandate is to push the company ahead with technology.

The Mac stemmed from this drive and will provide Apple with the surest future technological edge. Among the possibilities: reduced instruction set computing (RISC) computers with special-purpose chips, an audio-video interface, color laser printers and, perhaps, the ability to cast a global net for information.

## '91 target

By 1991, Apple should be unveiling a new line of computers. "Apple has to keep the hardware platform well above IBM's," says one source close to the company. "They have to have something twice as powerful as the IBM PS/2 Model 80. And I think they will in early 1991." Some of its features are expected to include the following:

- **RISC-based CPU.** The RISC CPU could be a good example of the Apple knack for offering innovation at the right moment. RISC chips already exist on some machines, and RISC coprocessors have appeared on boards for the Mac II. But Apple is expected to bring the technology to the mass market and use it to expand its technology edge in several areas, such as graphics and user interface.

The 1991 machine will likely center on a RISC-based CPU, according to an informed source. "They have to be looking at some sort of RISC-based technology just to keep up with price/performance requirements," adds Montgomery Securities' Shattuck.

- **Audio-video interface.** Apple has been demonstrating an audio-video interface featuring an on-screen "agent;" a cartoon-like character that speaks to you. For instance, you could turn on the computer and it would say, "Mail waiting." If you responded, "Open file such-and-such," the agent would open the file. Apple is previewing this idea now on its Cray Research, Inc. supercomputer; proponents say it will personalize interaction with the computer as never before.

"Merging audio-video and computer technology and throwing in communications for good measure is a very, very sexy market," Apple's Zeisler says.

But pitfalls lurk here. Not everyone finds the spectacle of intelligent professionals conversing with cartoon figures particularly enchanting. "Right now, there's all this talk about multimedia stuff, but it's hard to know what value it will have," says Stewart Alsop, editor of "PC Letter." "Apple has to continually interpret technology in such a way that they're meeting an unmet need for customers. They have to lay down their bets, but they may be wrong."

- **Display.** Apple is almost certainly developing a superior display. "We want a computer that gives as clean an image as a color TV, and that's about to happen," one insider states.
- **Printers.** Apple is also likely working on a higher density laser printer, and possibly a color one. "If Apple could do for color output what they did for black-and-white, I think they'd have a real winner," Shaffer says. "If they could combine Japanese hardware and their own cleverness in a software a la Postscript, it would be a sensation. I don't see why it can't be done."
- **Knowledge Navigator.** In John Sculley's book *Odyssey*, he describes a concept called the Knowledge Navigator, in which the Macintosh would automatically scan electronic archives throughout the nation and download articles, maps and charts on whatever topic users selected. The Knowledge Navigator would employ the audio-video interface, and Apple has developed a stunning five-minute video depicting it.

## Thinking ahead

Even Sculley does not expect this wonder before the 21st century, but Apple is already taking steps toward it. It is developing communications chips and desktop terminal adapters to work with AT&T's Integrated Services Digital Network, a voice, video and data transmission scheme expected to become a global communications network for businesses and residential customers.

Whether Apple can develop all these innovations by itself remains a matter of debate, but with its plump cushion of cash, it can always snatch up firms with promising products. It has already shown a shrewd touch with acquisitions and, financially, Apple may prefer to let start-ups take the risk of innovation. In any case, bringing innovations to market is a dark, sublime art. Apple has been a sorcerer at it, and no one can say for sure that there aren't more surprises in its little black bag. ■

# NUMBER, PLEASE:

*A graphical look at Apple's progress in the never-ending quest for a bigger slice of the computing pie in the corporate heartland*

## Comparison shopping

*Apple Macintosh product line configurations and pricing for existing and expected models*

| | Suggested retail price | With 30% corporate discount | Comparable MS-DOS PC |
|---|---|---|---|
| **Macintosh Plus** 1M byte RAM[1], single 800K-byte drive | $1,799 | $1,259 | $1,699 |
| **Macintosh SE** 1M byte RAM, dual 800K-byte floppy disks | $2,898 | $2,029 | $2,999 |
| **Macintosh SE** 1M byte RAM, single 800K-byte floppy disk, single internal 20M-byte hard disk | $3,698 | $2,589 | $3,999 |
| **Macintosh SE "plus"** (Expected) (Motorola 68000 based, 16-MHz) 2M bytes RAM, single 1.6M-byte floppy disk, single internal 40M-byte hard disk | $4,296 | $3,008 | $4,999 |
| **Macintosh II** 1M byte RAM, dual 800K-byte floppy disks | $3,898 | $2,729 | NA[2] |
| **Macintosh II** (Expected) (Limited slots) 1M byte RAM, single 1.6M-byte floppy disk, single internal 20M-byte hard disk | $4,598 | $3,219 | NA |
| **Macintosh II** 1M byte RAM, single 800K-byte floppy disk, single internal 40M-byte hard disk | $5,498 | $3,849 | $6,499 |
| **Macintosh II "plus"** (Expected) (Motorola 68030 based) 2M bytes RAM, single 1.6M-byte floppy disk, single internal 180M-byte hard disk | $8,500 | $5,950 | NA |
| **Macintosh II "plus"** (Expected) (68030 based) 2M bytes RAM single 1.6M-byte floppy disk, single internal 360M-byte hard disk | $10,000 | $7,000 | NA |
| **Laptop #1** (Expected) (68000 based, 16-MHz) 2M bytes RAM, dual 1.6M-byte floppy disk, optional 20M-byte hard disk | $6,000 | $4,200 | $4,700 |

[1] Random-access memory [2] Not applicable

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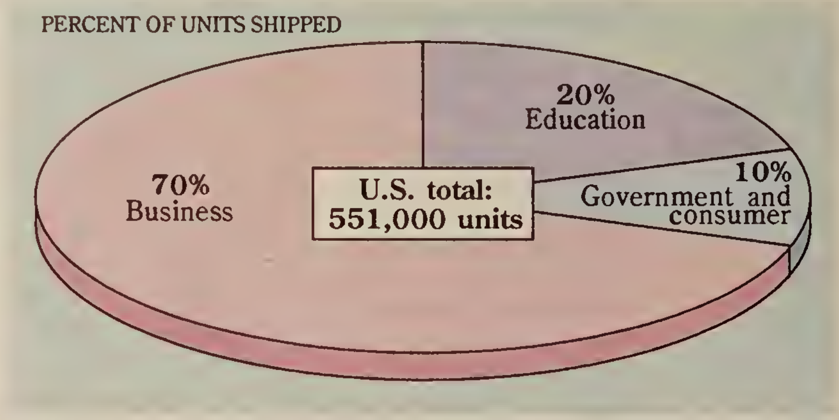
## Where they are going

*Business now garners 70% of Macintosh shipments, according to 1988 figures*



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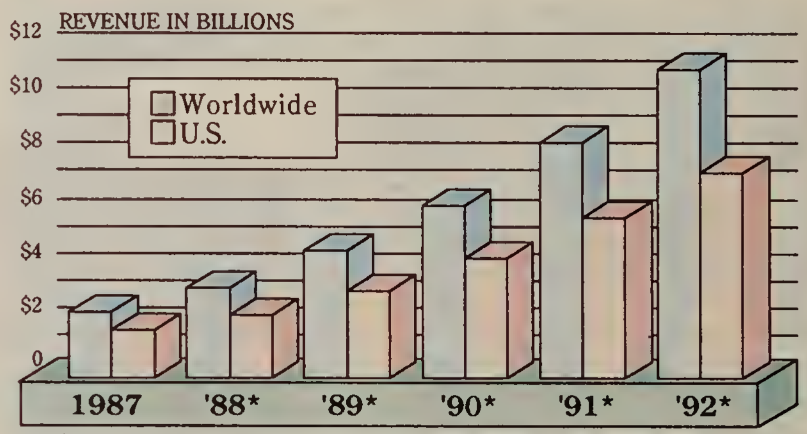
CW CHART

## Apple's Mac revenue forecast

*U.S. continues to contribute far more than half of Macintosh sales dollars*



*Projected

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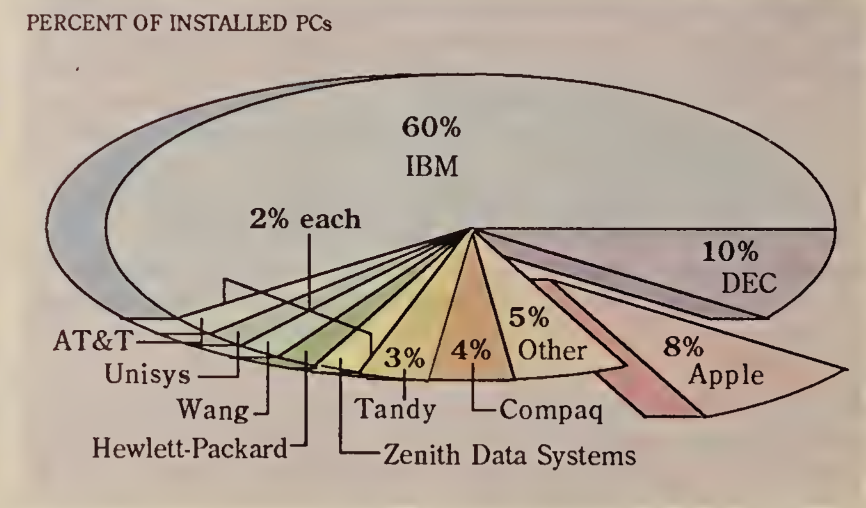
## Faring well at DEC sites

*Apple claims third largest slice of PCs installed at commercial VAX sites*



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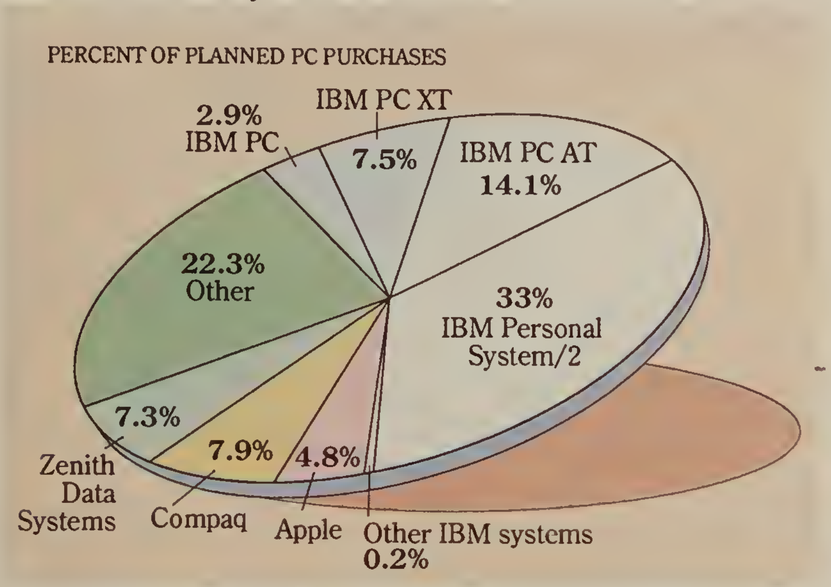
# SOME MAC STATS

### Planned purchases at IBM shops

*IBM and plug-compatible mainframe sites' buying plans show Apple still has cut only shallow inroads to the business market*



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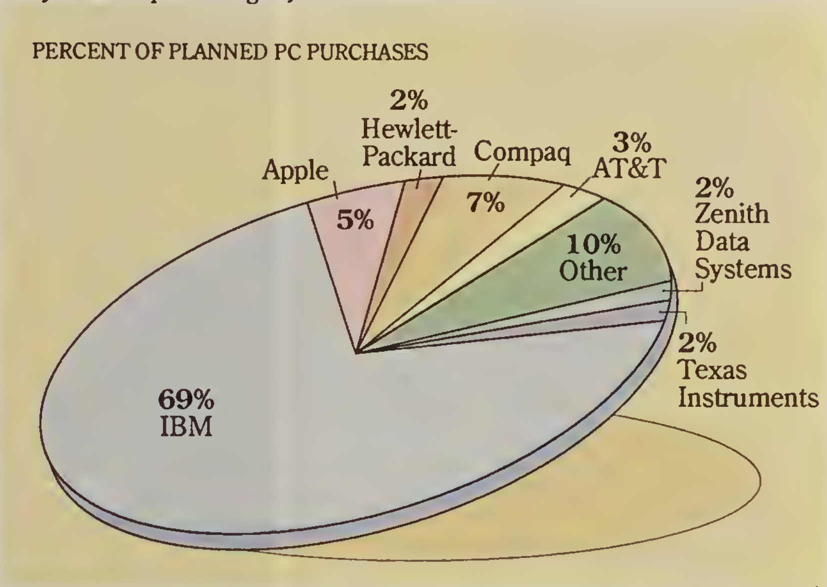
### Planned purchases at the Fortune 1,000

*Although Macintoshes are making headway, they still represent only a small percentage of PC sales*



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### How the Mac stacks up: A comparison of the Macintosh II with leading competitors

| | Apple Macintosh II | IBM Personal System/2 Model 80 | Sun Microsystems Sun 360I/150 | Compaq 386/20 | Sun Microsystems Sun 386I/250 |
|---|---|---|---|---|---|
| **MIPS rate** | 2 | 2.5 to 3 | 3 | 4 | 5 |
| **Key operating system** | Multifinder | OS/2 or MS-DOS | SunOS | OS/2 or MS-DOS | SunOS |
| **User interface** | Window, icon-bar menu | Window, bar menu | Window, icon-bar menu | Window, bar menu | Window, icon-bar menu |
| **Maximum user memory** (in bytes) | 1.5G | 16M (OS/2)<br>8M (MS-DOS) | 3G | 16M (OS/2)<br>8M (MS-DOS) | 3G |
| **DOS sessions under standard operating system** | Single with optional coprocessor | Single (OS/2) or multiple (MS-DOS) | Multiple | Single (OS/2) or multiple (MS-DOS) | Multiple |
| **Unix capability** | Optional: Apple A/UX or Unix-Mac | Optional: IBM AIX or Unix-DOS | Standard: SunOS | Optional: Unix-DOS | Standard: SunOS |
| **Standard processors** | 15.7-MHz Motorola 68020 CPU, Motorola 68881 math coprocessor | 16- or 20-MHz Intel 80386 CPU | 20-MHz 80386 CPU, Intel 80387 math coprocessor | 20-MHz 80386 CPU | 25-MHz 80386 CPU, 80387 math coprocessor |
| **Internal memory** (in bytes) | 1M to 8M | 1M or 2M to 16M | 4M to 16M, 32K cache optional | 1M to 16M, 32K cache | 8M to 16M, 32K cache |
| **Internal hard-disk options** | 40-msec 20M-byte,<br>40-msec 40M-byte,<br>30-msec 80M-byte | 40-msec 44M-byte,<br>30-msec 70M-byte,<br>28-msec 115M-byte,<br>28-msec 314M-byte | 18-msec 91M-byte,<br>17-msec 327M-byte | 30-msec 60M-byte,<br>20-msec 130M-byte,<br>20-msec 300M-byte | 18-msec 91M-byte,<br>17-msec 327M-byte |
| **Manufacturer-supplied graphics** | 640 by 480 16- or 256-color | 640 by 480 16-color,<br>1,024 by 768 256-color | 1,024 by 768<br>1,152 by 900<br>256-color | 640 by 480 16-color | 1,024 by 768<br>1,152 by 900<br>256-color |

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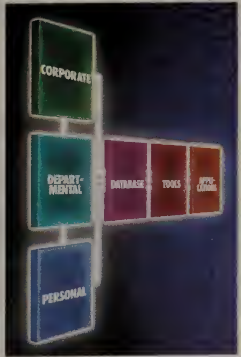

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# Mac Catches Fancy of Owens-Corning

*"We said, 'Hey, we ought to buy one,' and soon people were fighting over who would use it. One grew into two, and it just kept growing from there."*

William Corbin is a systems engineer at the Huntingdon, Pa., manufacturing facility of Owens-Corning Fiberglas Corp. Corbin introduced the Apple Macintosh to the entire company through his facility, and there are now more than 50 Macintoshes in the Huntingdon plant alone. Mac fever is spreading throughout Owens-Corning despite some resistance from corporate MIS. Senior Editor Glenn Rifkin spoke with Corbin about his experiences as a Mac pioneer.

**Even with the success you've had, the Macintosh is not on the official corporate "buy" list?**
No. The corporate PC is IBM.

**How long have you been using Macintoshes in your facility?**
Since February 1985.

**And you were the catalyst to get them in?**
Yes. I had gotten some computer training when I taught at Penn State, and when I came here to work, I saw a group of engineers and engineering support people who had no computers. They had two PCs in here, but they had no hard drives, limited memory, nothing fancy. People didn't care for them.

I knew a couple of local dealers were carrying the Macintoshes, and I'd play around with the Mac. I borrowed one, brought it in here and showed it to the plant engineer, head of engineering and some of the staff people. Right away, you'd see the spark that got things going. People really liked it. We said, 'Hey, we ought to buy one,' and soon people were fighting over who would use it. One grew into two, and it just kept growing from there.

**So MIS had nothing to do with bringing in the Mac?**
No.

**What applications did you use?**
Initially, we used Multiplan. This was before Excel, so Multiplan was the only spreadsheet available. That gave the engineering group a whole new way to do cost estimating, tracking project costs. It was something they always did by hand. That in itself was a big change. We also had word processing with Macwrite. What people liked in this department was that you could mix text and graphics together very easily. This being an engineering department, a lot of our write-ups are so much better when you can put the graphics in them.

Now, we don't use much in the way of word processing, it's all page layout programs . . . Ready, Set, Go, things like that. Excel is the spreadsheet of choice, by far. We've got all kinds of database files set up for everything from blueprint tracking to work-request planning. And CAD is big, we have MiniCAD and VersaCAD.

**You're using the Mac in lieu of an engineering workstation?**
We're finding the Mac II has the kind of capabilities that, for what you're paying for them, I don't know if I could justify going out and buying a $30,000 workstation. Also, our engineering group is different than others. We don't have any full-time, dedicated design engineers as such. There's no one in this department who works eight hours a day at CAD. Instead, they do project work, CAD work, cost work, troubleshooting. That's mainly because it is a manufacturing center rather than a corporate headquarters. So we really didn't want a dedicated machine in only a narrowly defined area. We wanted something that would allow someone to go from CAD, switch into word processing, at the same time maybe go up on E-mail and upload and download messages. We found with the Mac II, with the windowing environment, Multifinder and the cross compatibility of many of the programs, we were able to get that.

**What about the Mac as a networking tool?**
It's one of the concerns MIS has expressed. Will you people be an island unto yourselves? Will you be able to connect with the rest of us? We can talk to our corporate E-mail system with no problem. It runs over Compuserve. As long as your machine can handle ASCII, it's fine. We have our network set up down here so that we can upload or download to E-mail and retrieve data from corporate headquarters in the Lotus 1-2-3 format and still read it into Excel. There's no real big hassle with any of that. And people up on the other end don't know that the document they are getting from us was created on the Mac.

**Does the proprietariness of the Mac architecture present any problems?**
Our experience thus far is that we've been able to find third-party resources to help us connect with equipment in the corporation. Our company uses a lot of HP 3000s. There are a couple of different emulator packages that we have that do as good a job connecting to HP as HP's PC counterparts. We ran a test with the Amarillo, Texas, plant. They are running a program on the HP

3000 that we don't have up here. The project manager said he actually liked the Mac II environment better as an emulator on the HP because he could copy and paste and move all the HP data around to other packages in the Mac environment.

**What about supporting dual standards? Is that why there is corporate resistance?**
Yes. One of MIS's concerns, and rightfully so, is that there is going to be duplication of effort. We have had that happen. MIS is in a position of limited resources, and they just can't get to all the plants to satisfy all the needs. So a lot of us on the plant level have found that we can't wait for them to make the change. We're going to make the change.

**When you eventually hook the corporatewide environment together, will that present a problem?**
It could. That's something we've discussed. What we've tried to do here and with other people in the company is point out that in areas where we have our own local data and we're the only ones using it, we should have autonomy to do with it what we want. That's pretty strong among all the plants. There's a strong ownership . . . "Hey, we know what our local needs are, and we need some creative control over developing resources to satisfy those needs."

> *"What I'm not seeing is enough development in the Mac II for specific programs."*

MIS says, "That's fine for certain things, no problem. But what happens in the future for on-line purchase orders, for example? Are you all going to be able to compute across the board when it comes to something like that?" And we have had meetings with corporate people where the manufacturing people got together and said, "These are the kinds of services we'd like to have that are global in nature" rather than just local data facilities. The question has come up, "How do we satisfy the Mac people and the PC people?"

My belief is that as long as third parties are making good emulation packages for the Mac, it's really no different accessing that data from the Mac environment vs. the PC environment.

**What about advances coming with IBM's Personal System/2 and Presentation Manager? Will that make it more difficult to argue in favor of the Mac?**
I don't know yet. I haven't seen a lot of motion from our company yet to push in the direction of Presentation Manager or OS/2. All the PCs they are buying are PS/2 machines, but the focus is still on MS-DOS. I brought that up at a few meetings; MIS is concerned about having the two environments, PC and Mac. And I said, "You're going to have two environments within your own PC group here pretty soon." So far, they've taken a wait-and-see attitude toward OS/2.

**Has MIS stated that one of the problems with the Mac is that they don't want to go through dealers, they want direct access to Apple?**
That's not really come up. Their bigger concern is what if I quit, or what if I die?

**Do you see any other environments for Macintoshes emerging within the company?**
Oh yes. People interacting with our department will come in here and see something we've done for them. They'll say, "That's neat, how are you doing that? How did you do that on a PC?" And we say, "We didn't do it on a PC, we did it on a Mac." There are people out there getting ideas about how to use the Mac, integrating text and graphics. The other big thing is ease of use. They don't care if it's CAD or desktop presentation or whatever. They say, "Hey, you mean I don't have to type in all those commands?" That's captured some people's fancy.

**Are there drawbacks with the Mac?**
At first, the big drawback was the small screen on the original Mac Pluses. For those people who still have them now, it's a bit of a drawback. You just can't see the whole page. In your spreadsheets or databases, you've just got to limit your view area. When we took a bunch of people and upgraded them to Mac IIs, they said, "Wow this is great, big screen, more speed." Then they complained that the Mac IIs were too big to take home.

**If you could give John Sculley advice, what would it be?**
The first thing is drop the price, bring the Mac Plus and Mac II prices down a bit. Also, push a little faster on some connectivity issues. There's a lot I hear is in the works, the peer-to-peer connections, the ability to connect with VAXs, but I don't see a real focused strategy yet. All the bits and pieces are there, but I would like to see them pull it together. I'd also like to see them start writing more applications for the Mac II specifically. What I'm not seeing is enough development just in the Mac II area for specific programs to take advantage of the higher speed, higher performance CPU. ■

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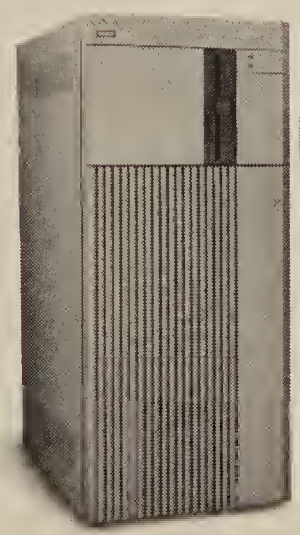

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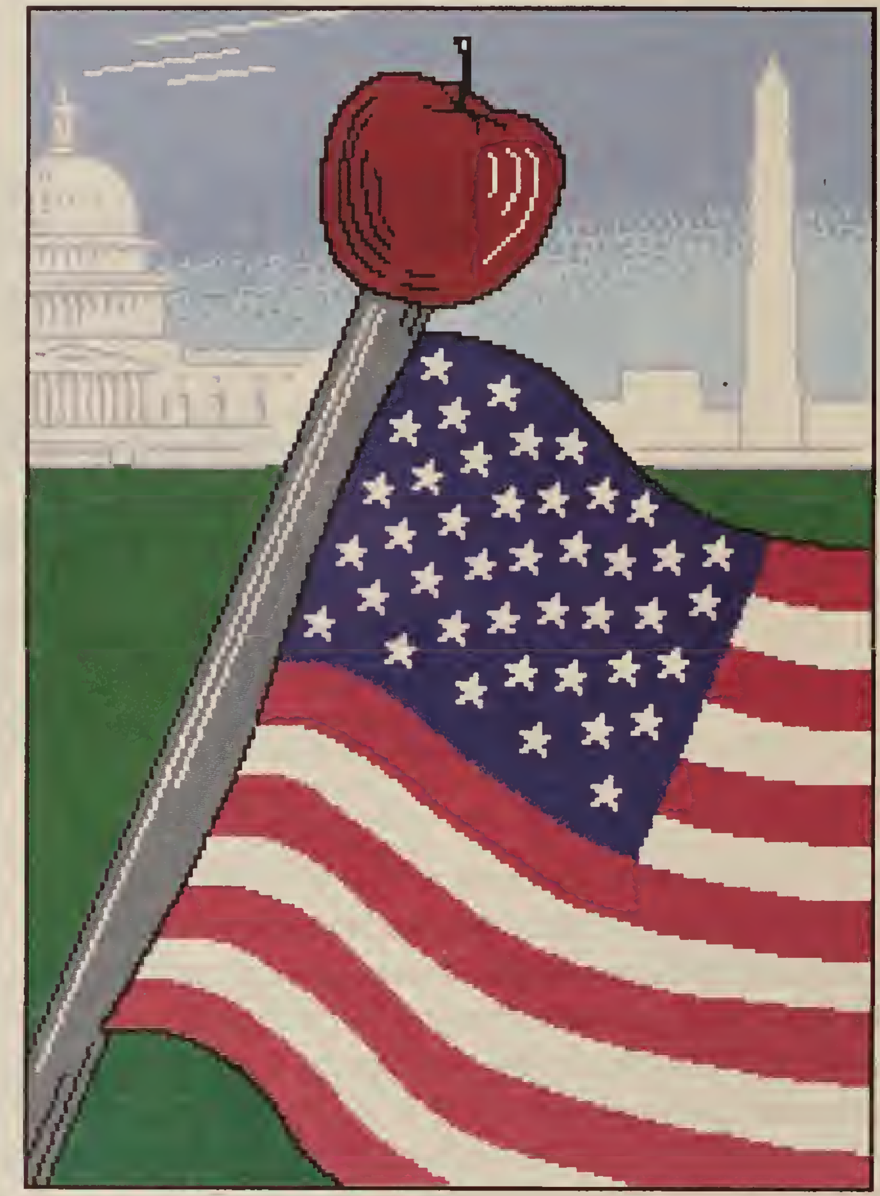
# Uncle Sam Salutes the Mac



*Apple peeled off 5% of the federal PC market from Zenith, IBM*

**BY MITCH BETTS**

Slowly but surely, the Macintosh is infiltrating a traditional stronghold for IBM-compatible micros: the U.S. government. Even so, it sometimes seems as if it takes an act of Congress to buy a Mac.

The U.S. Air Force, for example, has such a strong bias toward the Microsoft Corp. MS-DOS world that when the Strategic Air Command (SAC) in Omaha wanted to buy a network of 60 Macintoshes, it had to obtain a waiver from Gen. Robert H. Ludwig to stray from the Air Force's standard contract for Zenith Data Systems' PC compatibles.

Col. Joe LaBenne, deputy director of advanced systems, undertook the rigorous process of justifying a waiver from the Zenith standard. The Macintosh II and SE were the first products to meet SAC requirements for graphics, common user interfaces and low-cost training and networks, LaBenne says, "and I would not give up until the procurement met my requirements."

Mac evangelists like LaBenne, with help from Apple's new federal marketing group in Reston, Va., are gradually breaking down the barriers to Mac penetration in the federal government. "It's been a successful strategy, but there's still plenty of opportunity for them to expand," says David Powell, a workstation specialist at the National Institutes of Health (NIH) in Bethesda, Md.

Apple has gained a 5% share of the federal micro market in the short time it has been a significant player, but that is dwarfed by the 50% share held by IBM and the 23% share held by Zenith, according to Computer Intelligence, a market research firm based in La Jolla, Calif.

Thomas Young, an analyst at Computer Intelligence, indicates that Apple is steadily gaining on Compaq Computer Corp. and may surpass Compaq next year as the No. 3 micro supplier to Uncle Sam. About 90% of the Apple micros sold to the government are Macintoshes, he says. Apple's window of opportunity for capturing federal market share is not unlimited, however. One expert says the Macintosh and IBM's Personal System/2 are locked in an "interesting horse race" to see which will be the government's next de facto standard. While the loser is not locked out completely — a waiver can be had to permit a deviation from the standard — the road is much tougher through the bureaucracy.

Apple's board of directors decided nearly two years ago to gain some credibility in the federal market by opening a local office and entering a few procurement contests, says C. Lloyd Mahaffey, director of Apple's Federal Systems Group in Reston. Before then, "everybody in the federal government thought Apple was a toy company," he says.

Last December, Apple launched the second phase of its federal effort. The size of the Reston staff was doubled to 100 people, upgraded on the Apple organizational chart as the Federal Systems Group and reorganized. The federal group now has separate operations staffs for civilian and defense/intelligence agencies; seven branch offices in key cities; and a Complex Systems Division to deal with systems integrators, such as Planning Research Corp. in McLean, Va.

Most federal buyers have their eyes on the Mac II because it is suited for use as a graphics workstation or low-end engineering workstation, says Tom Ellis, president of Falcon Microsystems, Inc. in Landover, Md., the largest Apple reseller to the government.

"We're in the second wave of Apple users," Ellis says. "We've gone beyond the Macintosh champion or guru to a much broader base of users now."

Daniel Adkins, past chairman of the federal special interest group of the Washington Apple Pi users group, says there are three categories of federal Mac installations:

- Research-oriented departments that get

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Betts is *Computerworld's* Washington, D.C., senior correspondent.

*Before Apple entered some procurement contests, "everybody in the federal government thought Apple was a toy company."*

C. LLOYD MAHAFFEY
APPLE'S FEDERAL SYSTEMS GROUP

the Macintosh for its advanced graphics, such as the NIH.

- Agencies that view the Mac as the de facto standard for desktop publishing, such as the U.S. Environmental Protection Agency.
- Sites where the Macintosh is the microcomputing standard; such sites include the Naval Weapons Center in China Lake, Calif.

**Entry points**

Macintoshes enter government service at a variety of points — sometimes at the user level, sometimes from top-level edicts and sometimes sneaking in the back door when government contractors introduce federal employees to the Mac, Adkins says.

The U.S. Department of Energy in Washington, D.C., where Adkins is a petroleum supply specialist, bought 20 Macintoshes last year to produce a major report to President Reagan on energy security.

With the desktop publishing operation, the policy office could add graphics and make changes in the publication at virtually the last minute, Adkins says.

*Mac evangelists are breaking down the barriers to Mac penetration in the federal government.*

The DOE's decision to obtain the Macintoshes was made by William F. Martin, then deputy secretary of energy and a Mac enthusiast, Adkins recalls, illustrating the fact that Macintoshes can penetrate government offices via senior-level executives.

**People's choice**

An example of the bottom-up approach is the NIH, where the Computer Research and Technology Division decided to officially support the Macintosh as a workstation because of grass-roots user support, NIH's Powell says.

Powell is the leader of the Biomedical Research Macintosh Users Group (affectionately called "Beermug"), which has 300 users on its mailing list and 25 to 50 attendees at its meetings. "The success of the users group was cited by management as being a clear sign that the Mac was something that researchers wanted and needed," Powell says. The NIH now has roughly 500 Macintoshes, and that figure is likely to double next year, he adds.

The other reason the NIH adopted the Mac as a standard platform, along with IBM micros, was that Apple demonstrated its commitment to the government market by opening a federal marketing and support office. "I'm certain that our division would not have elected to support the Macintosh if Apple hadn't made that move," Powell says.

**Good decision**

Users say that Apple has made a lot of smart moves in its federal marketing effort, but they feel the best was simply the decision to aggressively enter the market.

Apple reportedly hopes that the government market will become 10% of its business. Mahaffey will not disclose the Federal Systems Group's share of Apple's business, but he discloses that the group has already submitted bids for government contracts that could potentially amount to $1 billion in business during the next five years.

One reason Apple can enter those bidding contests is its commitment to making its technology comply with government standards such as the Posix standard for software portability, the Government Open Systems Interconnect Profile for computer networking and the National Security Agency's computer security standards.

Moreover, the introduction of Apple's Unix-flavored operating system, A/UX, made it possible for Apple to bid for large Unix contracts at the U.S. Army and the Federal Aviation Administration. "That's why, inside Apple, the Federal Systems Group has taken the lead on our A/UX product and worked with the A/UX development team to ensure that we can comply with the government requirements," Mahaffey says. ■

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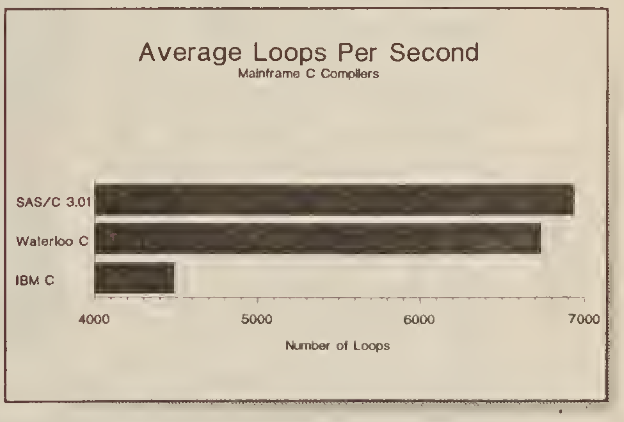

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# What to Expect from Apple-DEC Alliance

*Results of VAX-Mac union are less exciting for both companies than initial announcement*

**BY MICHAEL MILLIKIN**

John Sculley and Ken Olsen wowed audiences coast to coast with the dramatic announcement of a formal Apple-Digital Equipment Corp. alliance in January. But what is emerging from this coziness is likely to be less exciting than what was envisioned when the two powerful industry leaders shared the spotlight.

Nothing either vendor is working on producing will be exceptionally unique to the VAX-Mac union. This is, crestfallen Macintosh evangelists aside, the only sensible way to approach the marketplace at this point in time. DEC certainly would gain nothing by excluding the dominant IBM Personal Computer workstation platform from its network — or even by treating the PC as a second-class citizen.

Nor would Apple find its interests best served by single-minded pursuit of a VAX connection at the expense of tapping into IBM's Systems Application Architecture. However, both vendors gain from cooperation mainly by speeding the development process.

Reaction to the relationship falls predictably along partisan lines. Mac fanatics seem to regard the alliance as a giant thumb stuck into IBM's eye. The DEC-Apple alliance would sweep corporate desk tops clean of those pestilential PCs, for which neither DEC nor Apple has much affection.

DEC supporters, for their part, seem to view the Mac as the next most acceptable alternative on the desk top (following, of course, any DEC product).

Indeed, there is a great deal of potential synergy between the two companies because of the high penetration of Macintoshes into DEC accounts. For both companies, however, the alliance is just one aspect of broader strategic plans.

For Apple, the alliance does bestow the Mac with increased legitimacy as a corporate machine. Not that the Mac had none; on the contrary, Apple has been working very hard to increase its communications and connectivity abilities. DEC is currently the largest major systems vendor substantively working to integrate the Mac into the larger information architecture. That proselytizing is good for Apple, but it is also good for DEC.

The alliance improves DEC's story about personal computer integration. Back in January, the relationship with Apple seemed particularly special. Since then, however, DEC has also entered into technology-sharing agreements with other PC system and component vendors (Compaq Computer Corp. and Phoenix Technologies Ltd., to name two). The Apple agreement thus becomes one aspect of a broader plan by DEC to seamlessly embrace a variety of standard workstation platforms within its architecture as proposed in the Network Application Support aspect of Decnet Phase V (Decnet/OSI).

**The Apple view**

The Mac initially had a difficult time gaining corporate acceptance because of its limited networking and communications possibilities. That condition is being corrected. Now, Apple says, the Mac should be as acceptable a desk top solution for a corporation as is an IBM PC. Apple's efforts in integration are far from DEC-centric, however.

Since the Apple-DEC announcement, Apple has acquired two major connectivity companies, Network Innovations Corp. and Orion Network Systems, Inc. Network Innovations is attractive primarily

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Millikin is vice-president of the Seybold Office Computing Group in Boston.

for its CL/1 server and software that gives Macintoshes transparent access to DEC VMS databases through the implementation of a client/server model.

Then, also early in June, Novell, Inc. announced its long-expected support of the Mac on Netware. The acquisition of Network Innovations and CL/1 demonstrates that Apple isn't sitting around waiting for the joint development with DEC to answer connectivity questions. Apple is driving ahead solidly on its own, and CL/1 will be a major component in Apple's own connectivity plans.

According to Apple's Sculley, Network Innovations won't focus solely on the Apple-DEC environment. The IBM host environment is targeted next, and beyond that, Apple and Network Innovations will produce CL/1 tool kits to support DOS and OS/2 workstations as well.

So the bottom line is that although Apple may have superior connectivity first to the DEC environment, either through its own efforts or as a result of the cooperative agreement, Apple isn't relying on that one approach; IBM connectivity is just as important.

### The DEC view

Identified areas of cooperation between Apple and DEC include the following:

- Mac access to VMS files.
- Distributed applications running on both systems.
- Electronic-mail compatibility.
- Document interchange via Digital Document Interchange Format (DDIF).
- Sharing of print resources.
- Terminal emulation.
- Joint specification of database standards.
- Network management tools.
- Electronic conferencing.
- Videotex.

These areas are also encompassed in the scope of DEC's Network Application Support services, which means that what is available for the Macintosh will also be available for DOS, OS/2 and Unix workstations as well.

With Network Application Support, DEC intends to provide users in a mixed system environment of VMS, DEC's Ultrix (Unix), Mac, DOS and OS/2 with the ability to have transparent, dynamic integration of information scattered across the enterprise.

Network Application Support has three primary components: Application Access Services, Business Communications Services and Information/Resource Sharing Services.

Under Application Access Services, DEC currently offers terminal emulation (with a promise to move to Decwindows-based distributed code and a piece of All-In-1 running on the Mac).

Business Communications Services is a big area for DEC, with solutions promised for electronic data interchange (ANSI X.12), E-mail (DEC's Mailbus), electronic conferencing and videotex.

Information/Resource Sharing Services provide support for a compound document environment as well as document interchange through DEC's DDIF, publishing services, network printing, file sharing and database access.

Put the two sets of features — those in Network Application Support and those in the DEC-Apple alliance — together, and you'll see that they map exactly. In other words, the fruit of this union is not going to be radically different than what will be available for other platforms.

> *Apple isn't relying on the DEC approach; IBM connectivity is just as important.*

Mac-to-VAX integration might not eventually be unique in terms of the functionality it delivers, but those products certainly could be out on the market first. All vendors are recognizing that the coming architectures will be networked and distributed; for example, applications will be split between host servers and workstations. There is an agonizing amount of development work that has to be done to make this happen, particularly since the workstation environment will by and large consist of standardized platforms. That means development efforts across multiple platforms.

For all the mileage DEC squeezed out of its "one company, one architecture" appeal, that approach soon will be relatively meaningless. DEC may have a uniform host/server systems platform, but it certainly is not going to have a solitary workstation platform.

Network Application Support is DEC's concession to market reality. The combinations that provide advanced solutions will be the combinations that win bids. It thus becomes in the vendors' best interests to cooperate as best they can to speed the development process.

For example, with its proposed DDIF, DEC is going to have a powerful marketing weapon. DDIF will eventually be able to become the foundation for compound documents spread across a network consisting of multiple operating system platforms. In order to tout this, however, DEC needs the other platforms to support DDIF. Thus, one of the major efforts between Apple and DEC will be to provide Mac support for DDIF. Again, for both vendors, the result is an attractive one. The issue of the alliance is not one of exclusivity — it is one of timing. ■

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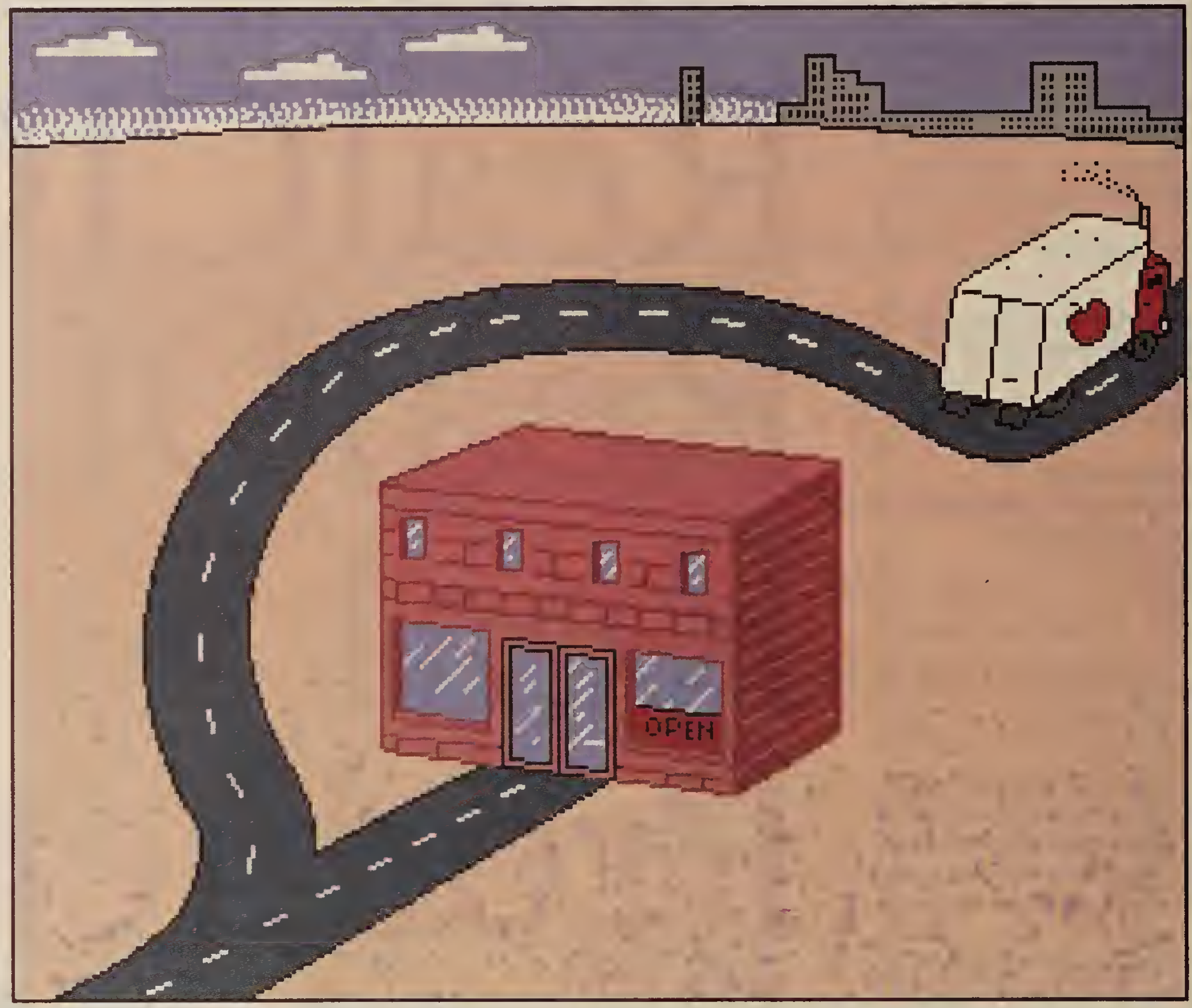
# COZYING UP TO DIRECT SALES

*Apple and its dealer network face unexpected challenges*



**BY BARBARA SEHR**

Few personal computer manufacturers devote as many resources to the care and feeding of their dealer network as does Apple. Long before IBM Personal Computer clones began their battle for shelf space and the hearts and pocketbooks of consumers, Apple had established a large network of dealers that sold its popular Apple II exclusively. That network is still very much in place, selling Apple's Macintosh product line.

Today, however, Apple and its dealer network face a challenge that is fraught with conflict for these once bosom buddies. The present-generation Macintosh has been targeted at corporate users who demand aid and comfort of a different sort.

Large corporate accounts want hand-holding and tender loving care that often can only be accomplished through direct sales. Selling into MIS departments in the Fortune 1,000 can be done through a dealer or a value-added reseller. But in competing with IBM, which perfected the art form of direct sales, Apple finds itself trying to sit at two weddings with one derriere.

Sensing a growing corporate demand for the Macintosh, Apple established its National Accounts Program in 1984 to offer "a direct interface" between the manufacturer and its largest corporate customers. Within a year, the National Accounts Program grew to 200 customers.

Michael Coleman, coordinator of technical research and development at Aluminum Company of America (Alcoa) in Pittsburgh, says his company, with Macintoshes representing 25% of its PCs, works directly with Apple for sales, system delivery and support. "There are times when we deal with a local computer store," Coleman says, "but that is the exception rather than the rule."

Apple's dealers, however, were none too pleased with this turnabout. They wanted to know if this signaled a dramatic change in Apple's philosophy; that the company would now compete directly with them. The company assured them that it didn't.

Instead of expanding the National Accounts Program, the company attempted to combine the best of both worlds by recently establishing the Account Manager Program, according to George Everhart, director of business marketing at Apple.

Some 200 other corporate user sites have opted for the Account Manager Program, in which systems are delivered through a third party. The Apple account manager is responsible for setting up the sale and acts as a liaison between the customer and local dealer. The product itself is then delivered through either a local dealer or a value-added reseller.

A major advantage of the program is the direct link it provides to Apple's future plans. To corporate users planning future system acquisitions, this is a key element of the arrangement, at least as important as the volume discounts.

Advance information also means Apple Account Manager Program participants serve as beta-test sites, a function not typically provided to small users, who may buy their systems through the same dealer.

There is no financial advantage for a customer to choose between the Account Manager Program or the National Accounts Program, Everhart says. The National Accounts Program still exists; some accounts remain reluctant to do business of any sort with a dealer.

However, only some 75 accounts remain in that program, according to Everhart, and he says he does not expect the number to expand. In fact, he says, some of those customers have requested participation in the Account Manager Program — especially those corporate customers with locations in remote areas. "They are discovering that the needs of the local plant can be better served through a local dealer," Everhart says. ■

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Sehr is a free-lance writer based in Seattle.

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# PRODUCT SPOTLIGHT

# SOFTWARE FOR THE IBM MID-RANGE

JOHN DYKES

## Resident users welcome a change of pace

BY ALAN RADDING

The IBM mid-range market — turf of the System/34, 36 and 38 — has been a haven for the small, low-profile software developer. Few famous names or fancy marketers from other places stopped here to peddle their wares. There were plenty of people to sell to, but it was considered hard-scrabble territory, where workhorse machines labored for businesses that wouldn't make any list *Fortune* magazine would consider publishing.

Users span a number of industries, but what really distinguishes this group is size. According to Focus Research Systems, a market research firm in West Hartford, Conn., two-thirds of these organizations had 250 employees or less.

What these users were looking for in the System/34 and 36, for the most part, was a basic data processing system for applications such as accounting and inventory control rather than a platform for the development of sophisticated management information systems.

"They wanted an existing package. They didn't want a development platform," says Paul Conte, senior technical editor of "News/3X-400," a Loveland, Colo.-based newsletter.

### INSIDE

**Welcome for New Arrival**
Developers toast IBM's openness and the AS/400's ecumenical interface.
Page 46.

**Ask the Vendor**
Vendors answer questions about creating 401K reports, purging old data and more.
Page 44.

### Overcoming obstacles

While simplicity was a benefit to users, it proved to be a hindrance to commercial software development.

Major software vendors, hindered by the machines' inability to provide the power necessary to run sophisticated applications, shied away from writing for this small, diverse group of users. This vacuum created a fertile ground for the development of an insular culture of small-scale software developers, many of whom were initially contracted to develop custom software and later turned the results into

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Radding is a Boston-based author specializing in business and technology.

# ASK THE VENDOR

*The following questions were solicited from users and conveyed to the vendors for responses.*

**Logic International's software is currently written in the company's version of RPG-II, which allows us to run it on an IBM System/38. Will a version in RPG-III be released in the near future?**

*Larry Middleton*
*Masland Carpet, Inc.*
*Mobile, Ala.*

LOGIC INTERNATIONAL, INC.: We are planning to release RPG-III versions of our applications by the end of this month.

**When using Bancroft's Versatile Pay Management System payroll software, how can we register exempt employees so that no taxes are deducted from their paychecks but the wages show up on our quarterly tax revenue?**

*Pam Cobb*
*Excel Industries, Inc.*
*Phoenix*

BANCROFT COMPUTER SYSTEMS, INC.: In the employee master file maintenance screen D, for total number of exemptions to claim for state taxes, enter 99. This will instruct the system to not deduct taxes from the paycheck but will list the wages on your quarterly tax revenue.

**We have been running New Generation Software's Accounts Payable and General Ledger packages since 1983. Can we purge some of the old data and distributions?**

*Leo Dombchewsky*
*Mrs. Paul's Kitchens*
*Philadelphia*

NEW GENERATION SOFTWARE, INC.: Within the General Ledger and Accounts Payable systems, you can purge posted journals and distribution history using a built-in menu-based facility.

**I need to create a report at year's end to show the total employee 401K deductions by month, but our payroll totals are rolled forward every month and every quarter. How can I store data in Michaels, Ross & Cole's mrc-Query series so that this report can be created?**

*Marie Matys*
*Coca-Cola Bottling Company of Chicago*
*Niles, Ill.*

MICHAELS, ROSS & COLE LTD.: Generate a summary file with the mrc-Query series that will store each month's 401K deductions for each employee. Then take the generated code and, with some customization, make it part of your period-close process. This would store monthly 401K deposits for the entire year and enable you to report contributions to date. •

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- Intercompany payments
- P/Os match receipt and inspection
- Query P/O status
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- Calculator-like decimals
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- Direct deposits
- Automatic tips processing
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- 15 depreciation methods
- Luxury car depreciation
- Single- or multi-period processing
- Short year handling
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# Users

FROM PAGE 43

commercial packages.

Things first changed when the System/38 came along. That machine, introduced in 1978, sported a faster, more advanced architecture, a 64-bit address and object-oriented programming. It attracted some new buyers who were slightly more prosperous and considerably more adventurous than the typical owner of either the now-discontinued System/34 or the vastly popular System/36.

If the System/38 shifted the software landscape for developers and users, the Application System/400 has major seismic potential. IBM mid-range users were catapulted into prominence with the June announcement of the AS/400. These users now have a product that is at the forefront of IBM's development strategy and the center of much interest from a wider range of software providers.

## Upbeat responses

Users' initial reactions to the AS/400 are mostly positive. They express little fear that their systems — hardware and software — will be left unsupported as a result of the new product line.

Theodore Schatzberg, president of New York-based clothing manufacturer After Five, regards the AS/400 both as a means for adding new applications and as an investment hedge against the future.

After Five, a leading manufacturer of women's evening clothes, is a System/36 shop. It is also fairly representative of the manufacturing industry, the largest grouping of IBM mid-range installations. With six terminals, the company isn't approaching the limits of the System/36, but the introduction of the AS/400 has led Schatzberg to consider an upgrade. He remembers the lesson in economics he received when the System/36 came out and the company's System/34 lost its value. "The 36 will still have some value," he says, "but if we have a decent season, I might dump it now."

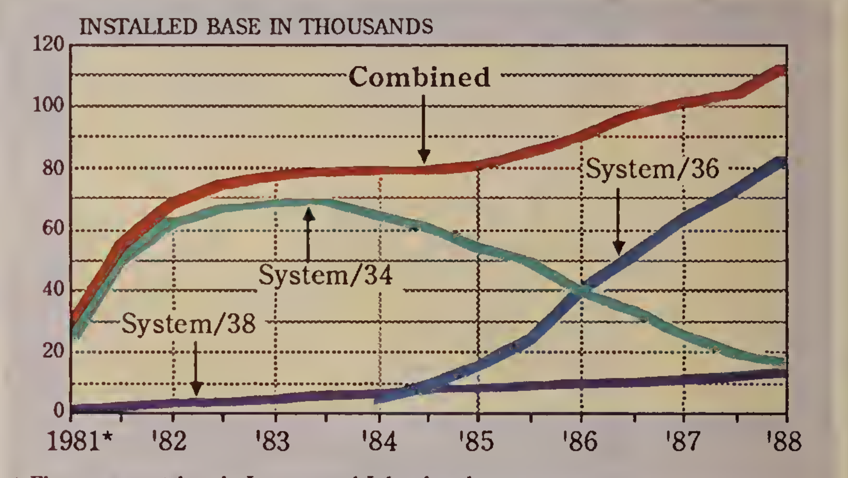
Eleven years ago, the company purchased a System/34; in 1985, it upgraded to the System/36 it currently uses. Like most small IBM mid-range installations, the System/36 at After Five is used for administrative and financial DP operations.

When he is not busy as president, Schatzberg is also the company's DP manager. With the System/36, however, there is little to manage. Except for the computer operators, After Five has no in-house DP staff or professional computer expertise. The appeal of the System/36 is its ease of use. "Everything is menu-driven and simple to learn," Schatzberg explains.

A pioneer in the IBM mid-range market, After Five developed its own administrative applications with the help of a consultant, primarily because appropriate commercial packages weren't widely available. Over the years, After Five returned to the same consulting company for enhancements such as work-in-progress, inventory control and materials requirement planning applications. As happened in similar situations, the consultants now sell a version of the system they developed for After Five as a turnkey solution. Schatzberg, however, has decided he would rather buy finished solutions than participate in development. Writing custom software applications is not, he says, the most effective way to go.

## Favored system status

*Although the System/38 has made strong gains since its introduction, at the beginning of this year, the System/36 accounted for almost three quarters of the installed base for IBM's mid-range*



* Figures were taken in January and July of each year

INFORMATION PROVIDED BY COMPUTER INTELLIGENCE

Schatzberg is, for example, keeping a watchful eye on the latest offerings in general ledger software. "I don't like any of the general ledger packages I've seen so far," he says, "but eventually we'll find something."

**News/3X-400's Conte**

Nathan Baden, president of New York-based Baden Manufacturing, is ready to jump to the AS/400. Long frustrated with the slowness of the System/36, Baden has a list of improvements, such as the addition of communications capabilities, that he wants to make to his applications.

Baden Manufacturing, a wholesale office supply company, uses its System/36 for daily administrative and financial functions and was attracted to the machine because it doesn't require constant professional attention. Six years ago, the company, which has 50 employees and about 300 accounts, upgraded its System/34 to a 36. Fifteen terminals are attached to the machine, half of which are used for order entry.

Baden uses the computer primarily for order entry, accounts receivables, invoicing and inventory control. The applications for these tasks were developed by contract programmers.

Baden also unsuccessfully shopped for commercial applications. "I looked at commercial packages but didn't like them. They had too many things I didn't want," he explains. He says he feels his applications "are much simpler and they do what I want to do, the way I want to do it."

Even with the applications work he has done over the years, Baden still isn't completely satisfied with the system. "It's not that complete. There are a lot of holes. There are many more things we wanted to do, but the machine is slow as it is, so I stopped putting on applications," he explains.

But the wholesale office supply industry is very competitive and highly computerized. In response to his competition's use of what he describes as very sophisticated systems, Baden is upgrading some of his applications. "I'm having a programmer come back and start writing again. We're going to add new features, like on-line order entry," he says.

In the process of managing his System/36, Baden became a self-taught computer authority. He has been frustrated by what he says is the lack of technical detail being made available about the AS/400. "I was concerned about RPG," he says. "[IBM was] saying that RPG is not included under SAA, so I was worried that RPG wouldn't be supported. But now I see that RPG is a major language on the AS/400." Because RPG is available on the AS/400, Baden is confident he will be able to move his current software over to the new system.

## Curious, but not committed

Like most IBM mid-range users, Marc Spencer, manager of systems and programming at

> "SOME OF THE applications we have developed, like our work order program, outshine anything on the market."
>
> MARC SPENCER
> KNOTT'S BERRY FARM

Knott's Berry Farm in Buena Park, Calif., has been following the AS/400 developments. The company has not yet reached the limits of its System/38, so upgrading isn't a pressing issue. "We've talked about it, but we're not doing anything yet," he says.

Knott's Berry Farm is a sprawling amusement park rivaling its neighbor Disneyland. While the company is not a conventional retail establishment, it is typical of a sophisticated System/38 shop. The business is an entertainment enterprise encompassing a restaurant and food service operation and a retail operation along with ticket sales. To run its assorted enterprises, Knott's uses a System/38 with a mix of software developed by in-house and contract programmers and acquired from outside vendors.

**Bellin's Wildenberg**

The decision to add commercial packages was the result of acquiring the System/38. Knott's bought the machine in 1982, upgrading from an IBM System/3. For three years, the company ran both systems.

"We didn't want to convert the code," Spencer explains. "Finally, we ended up doing a massive conversion." Because of the difficulty of that conversion, Spencer says, the company began searching for commercial products, which are generally better documented and which a vendor will often customize to the conversion.

Knott's uses commercial packages mainly for financial applications. The company uses the J. D. Edwards & Co. accounting package, including general ledger and accounts payable.

Spencer is also considering buying a package to generate and track season passes for the park from any of several outside vendors.

The company might have shopped for a commercial retail package except that, in effect, it already had one in the food service program it developed in-house.

"The food service programs were the first things we put on the 38. The retail programs were simply a clone of that," with minimal changes required, Spencer explains.

"Some of the applications we have developed, like our work order program, outshine anything on the market," Spencer says. But as the organization contemplates switching to point-of-sale terminals instead of local cash registers, Spencer says it will move toward purchasing a commercial product. "I've looked at too many point-of-sale programs. I won't write one. There are enough out there that can do the job," he says.

Now that the company has all its applications running off the System/38, Spencer says he doesn't anticipate any problem moving to the AS/400 platform.

**All grown up**

At Bellin Memorial Hospital in Green Bay, Wis., the AS/400 announcement relieved some of the pressure of planning for the future.

According to Jim Wildenberg, assistant vice-president of hospital information systems, system use there has been evolving toward a full management information system. The largest question mark in that long-term strategy, he explains, was a plan to provide nurses with bedside access to patient chart information.

That projected step would require 200 additional terminals and push the hospital beyond the limits of its System/38.

"The AS/400 announcement convinced me that the decision to go with the System/38 was the right one. [The 38] has the capacity to meet our needs for a long time," Wildenberg says. He adds that any future move to the AS/400 will be an easy one, with a relatively simple conversion. Basically, all he would have to do is port the software over and boot it up.

Bellin Memorial maintains an active MIS department with eight programmers and a total staff of 20. The 243-bed hospital currently maintains two System/38s — with one used exclusively for testing and program development — and one System/36, used mostly for shared word processing. The hospital is automating its line services in a system built around the System/38.

Much of the hospital's software development has been handled in-house. General hospital management applications were developed internally.

And some specialized clinical and laboratory applications were created by a contract programmer. Bellin Memorial did purchase a materials management program developed and sold by another hospital. It also turned to a commercial supplier, Price Waterhouse, for a

*Continued on page 52*

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# Developers board AS/400 bandwagon

BY BOB COZZI

They say all things come to those who wait, and for IBM's System/36 and 38 software developers, the proof of that expression seems to lie in the Application System/400.

The AS/400 "provides a level of compatibility that the industry has been looking for," says Mark Wasilko, senior vice-president of marketing in the applications products division at Computer Associates International, Inc.

Wasilko is not alone in his reaction. Many software developers are applauding the new machine and rushing to provide support in the form of new packages. Some have already converted existing software to the AS/400 environment. Others say they will convert gradually, taking aim when the first wave of machines begin shipping. All seem to concur in the belief that customers will accept the AS/400.

One major reason for this enthusiasm is the openness IBM exhibited during the AS/400's development cycle.

**The new openness**

"I'd call it IBM's version of *glasnost*," says Jack Gable, vice-president of technology at software vendor American Software, Inc. "The world appreciates being consulted in advance."

Gable points out that IBM's willingness to bring software developers into AS/400's research and development process stands in stark contrast with its handling of other IBM mid-range and large-scale machines. In the past, he says, development work has taken place behind closed doors, frustrating developers and users alike.

With the AS/400, IBM opened its doors to both groups. The company's Rochester, Minn., laboratory, where the AS/400 was developed, held a "Migration Invitational," inviting broad-based advisory panels of developers and users to actively participate in the machine's development. The program, which took place early in the development cycle, was designed to give third-party software providers a sense that their input was welcome.

The beauty of AS/400 for developers is that IBM has taken the System/38 and wrapped it in a separate user interface similar to the System/36. Therefore, as newer technologies become available, the interface can be replaced with little or no impact on existing users. If a graphical "Mac-like" user interface is provided, as System Software Associates, Inc.'s Roger Covey suggests, that interface can be added to the system without affecting existing users.

> THE AS/400 "provides a level of compatibility that the industry has been looking for."
>
> MARK WASILKO
> COMPUTER ASSOCIATES
> INTERNATIONAL, INC.

Covey says he expects the OS/400, the AS/400's operating system, to be enhanced with windows and pull-down menus later this year. About a year after that, he estimates, easy-to-use software packages with true what-you-see-is-what-you-get interfaces will start to appear.

Right now, most developers are content that the interface allows them to concurrently support System/36 applications while also allowing those applications to execute in an AS/400 environment. Current System/36 and 38 users will be able to use the interface to simulate their systems while slowly migrating to the AS/400 environment through directly mapped functions.

There are no emulators on the AS/400. Instead, each System/36 or 38 function directly maps to an AS/400 function. For example, the System/36 $SFGR display interface is vastly different from the AS/400 interface, but rather than using a slow-running interpreter/emulator, the AS/400 converts the $SFGR source code to the equivalent AS/400 display source. The resulting source code is compiled as AS/400 (native) source.

To the System/36 application developer, however, the $SFGR source is syntax checked and diagnosed with the same messages produced by the System/36. This approach provides System/36 users with the same performance as native AS/400 users. Another reason the interface, a seemingly small line item in the AS/400's list of features, may turn out to be a sleeping giant is its potential

*Continued on page 52*

Cozzi is editor of *Midrange*, a trade publication for the IBM System/36 and 38 and Application System/400 communities.

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# Accounting software

| COMPANY | PRODUCT | RUNS ON IBM SYSTEM/36, 38 OR AS/400 | MODULAR OR INTEGRATED | STANDARD MODULES | INCLUDES A BUILT-IN REPORT WRITER | STANDARD REPORT TYPES PRODUCED | OFFERS USER-DEFINABLE REPORT FORMATS | MENU DRIVEN | ON-LINE HELP | CREATES COMPARATIVE STATEMENTS | POSTS RECURRING TRANSACTIONS | PRODUCES GRAPHS | INTERFACES WITH EXTERNAL SPREADSHEETS/DATABASES | SPECIAL FEATURES | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Adroit Systems Management, Inc.<br>(516) 496-8590** | AP | 36, 38, AS/400 | Modular | AP[1] | Yes | NP | No | Yes | Yes | Yes | Yes | No | None | NP | $5,000 (AP & AR[2]) |
| | AR | 36, 38, AS/400 | Modular | AP | Yes | NP | No | Yes | Yes | Yes | Yes | No | None | NP | $5,000 (AP & AR) |
| | GL[3] | 36, 38, AS/400 | Modular | AP | Yes | NP | No | Yes | Yes | Yes | Yes | No | None | NP | $8,000 |
| **American Software, Inc.<br>(404) 264-5296** | Accounting Solutions for IBM System/38 | 38, AS/400 | Integrated | GL, AP, AR | Yes | Financial reports | Yes | Yes | Yes | Yes | Yes | No | Lotus' 1-2-3 | Multiple assignment of GL accounts per item ID, extended 3-way matching for AP invoices | NP |
| **ASI Software, Inc.<br>(800) 255-2581** | Applications Systems Complete Solution | System/ 36 | Integrated | GL, AR, AP, payroll, job cost, inventory control, invoice, order entry | Yes | NP | Yes | Yes | Yes | Yes | NP | No | Any written in RPG | Single-entry formatting | NP |
| **Bancroft Computer Systems, Inc.<br>(318) 397-1377** | Financial Reporting System | 36, AS/400 | Modular | GL | No | NA | No | Yes | No | Yes | Yes | Line graphs | None | Unlimited company consolidations, 13-digit account numbers, 3-digit alphanumeric company numbers | $2,200/ module |
| | Accounts Receivable | 36, AS/400 | Modular | AR | No | NA | No | Yes | No | No | No | No | None | Unlimited company consolidations, 13-digit account numbers, 3-digit alphanumeric company numbers | $1,950/ module |
| | Accounts Payable | 36, AS/400 | Modular | AP | No | NA | No | Yes | No | No | Yes | No | None | Unlimited company consolidations, 13-digit account numbers, 3-digit alphanumeric company numbers | $2,000/ module |
| | Payroll | 36, AS/400 | Modular | Payroll | No | NA | No | Yes | No | No | Yes | No | None | Unlimited company consolidations, 13-digit account numbers, 3-digit alphanumeric company numbers | $2,250/ module |
| | Versatile Pay Management | 36, AS/400 | Modular | Payroll | No | NA | No | Yes | No | No | Yes | No | None | Works in all 50 states in one pay period, does 401Ks, deduction calculations | $4,000/ module |
| **Britz Publishing, Inc.<br>(800) 255-2028** | The Britz General Ledger | 36 | Modular | GL | No | NA | No | Yes | Yes | No | Yes | No | None | Transaction-driven, multicompany package, source code included | $199/module |
| | Bpay | 36 | Modular | AP | No | NA | No | Yes | Yes | No | Yes | No | None | Multicompany, source code included | $199/module |
| | ART System | 36 | Modular | AR | No | NA | No | Yes | Yes | No | No | No | None | Multicompany, open-item package, source code included | $99/module |
| **Gary Brown Associates, Inc.<br>(800) 422-3267** | General Financial | 36 | Integrated | GL, AP, AR, payroll | No | NA | No | Yes | Yes | Yes | Yes | No | None | On-line user manual | $2,000-$3,500/ module |
| | Fixed Assets | 36, 38, AS/400 | Integrated | Fixed assets | Yes | Additions, reports, disposal transfers, tax reports | Yes | Yes | Yes | No | No | No | None | NP | $2,500- $7,800 |
| **Business Computer Design<br>(312) 990-0900** | Business Computer Design Financial System | 34, 36 | Modular | GL, AP, AR, payroll | No | NA | No | Yes | No | Yes | Yes | No | None | Automatic payment and check processing, handles both hourly and salaried employees, easily updated tax tables | NP |
| | Capital Project Management | 36, 38, AS/400 | Integrated | Project management | Yes | Estimated cost to complete cost status, budget variance | Yes | Yes | Yes | No | No | No | None | NP | $2,500- $7,800 |
| **CCC Software, a division of the Computer Consulting Center, Inc.<br>(212) 564-9088** | Accounts Payable | 38, AS/400 | Modular | AP | Yes | Standard accounting reports | Yes | Yes | Yes | Yes | Yes | No | 1-2-3 | Multicompany, multidepartment, multibranch | $15,000/total |
| | General Ledger | 38, AS/400 | Modular | GL | Yes | Standard accounting reports | Yes | Yes | Yes | Yes | Yes | No | 1-2-3 | Multicompany, multidepartment, multibranch | $15,000/total |
| | Accounts Receivable | 38, AS/400 | Modular | AR | Yes | Standard accounting reports | Yes | Yes | Yes | Yes | Yes | No | 1-2-3 | Multicompany, multidepartment, multibranch | $15,000/total |
| **Chesapeake Computer Solutions, Inc.<br>(703) 687-3170** | Chesapeake Computer Solutions Accounting System | 36, AS/400 | Integrated | GL, AP, AR, payroll, job cost, property management, purchase orders, inventory | No | NA | Yes | Yes | Yes | Yes | Yes | No | None | For use in construction, property management and service dispatching industries | $2,500-$15,000/ total |
| **CODA, Inc.<br>(603) 647-9600** | IAS | 36, 38, AS/400 | Integrated | GL, AP, AR | Yes | Trial balance, balance sheet, income statement, aging, daily transaction | Yes | Yes | Yes | Yes | Yes | No | 20/20, 1-2-3, Microsoft Excel | Intercompany, multicurrency | $60,000-$300,000/ total |
| **Computer Associates International, Inc.<br>(516) 227-3300** | Masterpiece Financial Accounting Software | 36, 38, AS/400 | Integrated | GL, AP, AR, fixed assets, payroll/personnel, human resources | Yes | Up to 30 different reports | Yes | Yes | Yes | Yes | Yes | No | NP | Master-host relationship file design, smart link | $2,500-$40,320 |
| **Communicator Asystance Systems, Inc.<br>(508) 927-8144** | The CAS General Ledger & Financial Reporting System | 36, 38, AS/400 | Integrated | GL, budgeting, financial reporting, allocations, summarizations, consolidations | Yes | Financial reports | Yes | Yes | Yes | Yes | Yes | No | Any | 24-character, user-defined account numbers, multiple budgets/history, on-site training and converstion support | $9,750-$16,000/ total |

[1] Accounts payable [2] Accounts receivable [3] General Ledger

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, this is designated NP (not provided). When a question does not apply to a vendor's product, this is designated NA (not applicable). Further product information is available from the vendors.

| COMPANY | PRODUCT | RUNS ON IBM SYSTEM/36, 38 OR AS/400 | MODULAR OR INTEGRATED | STANDARD MODULES | INCLUDES A BUILT-IN REPORT WRITER | STANDARD REPORT TYPES PRODUCED | OFFERS USER-DEFINABLE REPORT FORMATS | MENU DRIVEN | ON-LINE HELP | CREATES COMPARATIVE STATEMENTS | POSTS RECURRING TRANSACTIONS | PRODUCES GRAPHS | INTERFACES WITH EXTERNAL SPREADSHEETS/DATABASES | SPECIAL FEATURES | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Communicator Asystance Systems, Inc.**<br>**(508) 927-8144** | Accounts Payable & Cash Disbursement System | 36, 38, AS/400 | Integrated | Invoice vouchering, manual/automatic check processing, detail/summary reporting, GL integration, governmental reporting, check reconciliation | Yes | Detail edit, transaction; age listings; liability; financial | Yes | Yes | Yes | NA | NA | No | NA | 12-character user-defined vendor numbers, partial payments, on-site training, conversion support | $7,500-$12,000/ total |
| | Accounts Receivable & Cash Control System | 36, 38, AS/400 | Integrated | Credit collection, on-line cash posting, GL integration, customer/detail reporting | Yes | Detail, summary, customer analysis statements, invoice/ transaction registers | Yes | Yes | Yes | NA | NA | No | NA | 12-character customer number, on-site training, conversion support | $7,000-$10,000/ total |
| **Computer Systems Consultants, Inc.**<br>**(301) 459-8100** | Nonprofit Fund Accounting System | 36, 38 AS/400 | Integrated | GL, AP, AR, payroll | No | NA | Yes | Yes | System/ 38 only | Yes | Yes | No | IBM spreadsheets for the System/36 and 38 | Designed for non-profit organizations, detailed budgeting | $2,000-$10,000/ module |
| **CTI Limited, Inc.**<br>**(214) 761-6456** | CTI Systems | 38, AS/400 | Integrated | GL, AP, AR, fixed asset, financial reporting, job cost, property managment, revenue forecasting, loan administration | Yes | Financial reports, operating statements | No | Yes | Yes | Yes | Yes | Pie, bar charts via personal computer | PC based | Uses relational database, programmed in color | $120,000/ total |
| **Daly & Wolcott**<br>**(401) 823-8400** | Fixed Assets Accounting System | 36 | Modular | Fixed assets | Yes | Depreciation register, acquisitions/ schedule reports, schedule comparisons | Yes | Yes | Yes | Yes | NA | No | None | Searches via descriptions, classifies assets, supports 1986 tax reform format | $2,500 one- time fee |
| **Darcor**<br>**(504) 888-6297** | Financial Systems | 36, AS/400 | Integrated | GL, AP, AR, fixed assets, payroll | No | NA | Yes | Yes | No | Yes | Yes | No | 1-2-3 | Automatic check and balance features transparent to the user | $2,800-$3,600/ module |
| **Data Processing Services, Inc.**<br>**(800) 654-4689** | Fin/36 | 36, AS/400 | Integrated | GL, AP, AR, fixed asset, payroll | Yes | Financial reports, operating statements | Yes | Yes | No | Yes | Yes | No | None | All modules come with 1-year warranty for maintenance & service, toll-free phone support | $3,000-$4,000/ module |
| | Fin/38 | 38 | Integrated | GL, AP, AR, fixed asset, payroll | Yes | Financial reports, operating statements | Yes | Yes | No | Yes | Yes | No | None | All modules come with 1-year warranty for maintenance & service, toll-free phone support | $6,000-$10,000/ module |
| **Dexel Systems Corp.**<br>**(703) 448-9400** | Dexel Accounting Systems | 36, AS/400 | Integrated | GL, AP, AR, order entry, inventory control, sales analysis, payroll, purchase order | Yes | NP | Yes | Yes | Yes | Yes | Yes | Bar charts | PC-based | Load feature, handles weights and cases, interfaces with bar coding | $3,000/ module or $6,000 |
| **Dynax Resources, Inc.**<br>**(516) 484-1144** | Dynax GL | 38, AS/400 | Modular | GL | Yes | Quarterly/ yearly comparisons, budget comparisons, recurring journal entry | Yes | Yes | Yes | Yes | Yes | No | None | Unlimited | $15,000 |
| | Dynax AP | 38, AS/400 | Modular | AP | No | NA | No | Yes | Yes | Yes | Yes | No | None | NP | $12,500 |
| | Dynax AR | 38, AS/400 | Modular | AR | No | NA | No | Yes | Yes | Yes | No | No | None | NP | $12,500 |
| | Order Fulfillment | 38, AS/400 | Modular | Order fulfillment | No | NA | No | Yes | Yes | Yes | Yes | No | None | Parts substitution | $7,500 |
| **J. D. Edwards & Co.**<br>**(303) 773-3732** | J. D. Edwards World Systems | 38, AS/400 | Integrated | GL, AP, AR, payroll, personnel, job cost, subcontracting, inventory management, purchasing, sales order processing, sales analysis, financial reporting | Yes | More than 200 standard reports | Yes | Yes | Yes | Yes | Yes | No | 1-2-3, Symphony | Multicurrency, multiple fiscal periods, multiple languages | $4,000-$30,000/ module |
| | J. D. Edwards S/36 Systems | 36 | Integrated | GL, AP, AR, managment reporting, order processing, sales analysis, payroll, personnel, job cost, property & equipment, partnership accounting | Yes | More than 100 | No | Yes | Yes | Yes | Yes | No | 1-2-3, Symphony | Multiple fiscal years, integrated budgeting | $4,000-$14,000/ module |
| **Executive Technology Data Systems, Inc.**<br>**(313) 553-6665** | Management Accounting System | 36, AS/400 | Integrated | GL, financial reporting, budget reporting, 1099s, trial balance | Yes | Balance sheet, income statement, cash flow, schedules, gross profit analysis, text historical reports, budget reports | Yes | Yes | Yes | Yes | Yes | No | Any via IBM query and PC support programs | Multiple versions of financials can be run simultaneously, automatic interface to financial modeling, payroll, depreciation systems | $6,100/total |
| **Gamma Software**<br>**(503) 770-5587** | Gamma Software Financials | 36, AS/400 | Integrated | GL, AP, AR, payroll, bank reconciliation | Yes | Financial statements | Yes | Yes | Yes | Yes | Yes | No | None | Multicompany, 12 or 13 accounting periods, multiple years | $13,000/total |
| **G.E.M. Data Processing Co.**<br>**(302) 846-9553** | General Accounting | 36 | Integrated | GL, AP, AR, payroll, budget | No | NA | Yes | Yes | Yes | Yes | Yes | No | None | NP | $13,600/ total |
| **Global Software, Inc.**<br>**(919) 872-7800** | Accounting & Distribution System | 38, AS/400 | Modular | GL, AP, AR, purchasing, credit management, order entry, billing, inventory, sales analysis, cost accounting, fixed assets | Yes | Trial balance, cost center summary, receivables/payables, aged trial balance, reorder reports, invoices, checks, purchase orders | Yes | Yes | Yes | Yes | Yes | 17 types including bar, line, scatter, pie, segmented | Any via DIF files | On-line, real-time GL reporting, full autocash, full pricing for order entry/ billing | $10,000-$80,000/ module |
| **HCE Computer Consultants**<br>**(817) 498-6350** | HCE Accounting | 36 | Integrated | GL, AP, AR, payroll | No | Income statements, balance sheet, aging chart of accounts, vendor list, check register, transaction reports, quarterly reports | No | Yes | Yes | Yes | Yes | No | None | NP | $2,500 |
| **J. Hunt & Associates**<br>**(612) 646-2254** | J. H. A. Software | 36 | Modular | GL, AP, AR, job cost, payroll | Yes | Balance sheet, income statement, open payables, open receivables, check register | Yes | Yes | No | Yes | No | No | No | NP | $1,500 (AP, AR), $2,500 (GL, payroll), $500 (job cost) |
| **IBM**<br>**Contact local IBM dealer** | Distribution Management Accounting System | 36, AS/400 | Modular | GL, AP, AR, billing, inventory control, sales analysis, purchasing, inventory managment, payroll | No | NA | Yes | Yes | Yes | Yes | No | No | None | Multiple company support, on-line user education, built-in question/answer data base | $1,900-$9,000/ module |
| **Info Systems of N.C., Inc.**<br>**(704) 535-7180** | Info Systems Financial Package | 36, AS/400 | Integrated | GL, AP, AR, payroll, fixed assets | No | NA | Yes | Yes | Yes | Yes | Yes | No | 1-2-3 | 1-year support | $1,500-$2,500 (System 36) or $1,500-$4,000 |

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CROSS INDUSTRY APPLICATIONS

**General Business**
General Ledger
Financial Reporting
Accounts Payable
Accounts Receivable
Property Management
Fixed Assets
Equipment Management
Payroll/Human Resources
Address Book
Electronic Mail

**Distribution**
Inventory Management
Purchasing
Sales Order Processing
Sales Analysis

VERTICAL INDUSTRY APPLICATIONS

**Construction**
Job Cost Accounting
Subcontracting

**Oil & Gas**
Joint Interest Accounting
Revenue Distribution
Production Accounting
Lease Records
Oil & Gas Contracts
Gas Balancing
Investor Services
AFE Accounting

| COMPANY | PRODUCT | RUNS ON IBM SYSTEM/36, 38 OR AS/400 | MODULAR OR INTEGRATED | STANDARD MODULES | INCLUDES A BUILT-IN REPORT WRITER | STANDARD REPORT TYPES PRODUCED | OFFERS USER-DEFINABLE REPORT FORMATS | MENU DRIVEN | ON-LINE HELP | CREATES COMPARATIVE STATEMENTS | POSTS RECURRING TRANSACTIONS | PRODUCES GRAPHS | INTERFACES WITH EXTERNAL SPREADSHEETS/DATABASES | SPECIAL FEATURES | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Innovative Business Systems, Inc.**<br>**(608) 271-2010** | General Ledger, Accounts Payable, Accounts Receivable | 36, AS/400 | Integrated | GL, AP, AR | Yes | AR transactions, trial balance, aged trial balance, payable due date reports, income statements, balance sheet | Yes | Yes | Yes | Yes | Yes | No | 1-2-3 | Up to 19-digit account number | $2,500-$3,000/ module |
| **Interactive Software Services, Inc.**<br>**(800) 288-8550** | Insight Accounting Series | 36, 38 | Integrated | GL, AP, AR, financial modeling, purchase order | Yes | Transaction history report, cash requirements, user-defined dunning letters, standard cost variance | Yes | Yes | Yes | Yes | Yes | Histograms, pie charts | 1-2-3 | Currency conversion, multicompany consolidation | $5,000-$16,000 |
| **Kim Computers, Inc.**<br>**(614) 766-4900** | Accounting Management Solutions | 36, AS/400 | Modular | GL, AP, AR, fixed assets, sales reporting, inventory, purchasing, payroll, cash flow management | Yes | Income statements, financial statements, vendor history, payroll tax report | Yes | Yes | Yes | Yes | yes | No | PC-based | Data zoom, show & pick features | $3,000-$7,000/ module |
| **Linton Shafer Computer Services, Inc.**<br>**(301) 695-5333** | Financial Reporting | 36 | Modular | Data collection, vendor tracking, 1099 reporting | No | NA | Yes | Yes | Yes | Yes | Yes | No | None | Remote PC data entry, interface with fixed-assets package | $3,850/total |
| | Accounts Payable | 36 | Modular | AP | No | NA | No | Yes | Yes | No | No | No | None | NP | $1,400/total |
| | Fixed Assets Accounting | 36 | Modular | Fixed assets | No | NA | No | Yes | Yes | No | No | No | None | NP | $1,600/total |
| | Payroll Accounting | 36 | Modular | Payroll | No | NA | No | Yes | Yes | No | No | No | None | Multistate, multi-company | $1,800/total |
| | Professional Time Management | 36 | Modular | Time management, AR, scheduling | No | NA | No | Yes | Yes | No | No | No | None | Staff- and client-scheduled due date monitoring | $4,300/total |
| **Logic International, Inc.**<br>**(404) 843-3282** | General Ledger | 36, 38, AS/400 | Integrated | GL | Yes | Transaction register, financial reports | Yes | Yes | Yes | Yes | Yes | No | None | Currency handling | $4,000-$9,000/ module |
| | Accounts Payable | 36, 38, AS/400 | Integrated | AP | No | NA | No | Yes | Yes | Yes | Yes | No | None | Multinational department reports, check control | $3,000-$8,000/ module |
| | Accounts Receivable | 36, 38, AS/400 | Integrated | AR | No | NA | No | Yes | Yes | Yes | Yes | No | None | Multinational department reports, check control | $3,000-$8,500/ module |
| **Maddenco, Inc.**<br>**(812) 425-1513** | General Ledger | 36, 38 | Modular | GL | Yes | Financial statements | Yes | Yes | Yes | Yes | Yes | No | None | Recurring entry, automatic reversing entry | $2,500/ module |
| | Payroll | 36, 38 | Modular | Payroll | Yes | Cash requirements | Yes | Yes | No | Yes | Yes | No | None | 401Ks | $2,500/ module |
| | Accounts Payable | 36, 38 | Modular | AP | Yes | Aging reports, check registrar | Yes | Yes | Yes | Yes | Yes | No | None | Multiple terms | $2,500/ module |
| | Accounts Receivable | 36, 38 | Modular | AR | Yes | Aging reports, check registrar | Yes | Yes | Yes | Yes | Yes | No | None | Multiple terms | $2,500/ module |
| | MAPICS II | 36, 38, AS/400 | Modular | GL, AP, AR, fixed assets, financial ratios, budget preparation, invoicing, payroll | Yes | Balance sheet, financial statements, registers and journals | Yes | Yes | Yes | Yes | Yes | No | None | Multicompany, built-in audits and controls, applications tailored by user | $2,330-$4,220 |
| | System/36 CMAS | 36 | Modular | GL, AP, cross-application support, job cost, payroll labor costing, revenue accounting, committed cost, cost history | No | NA | No | Yes | No | Yes | No | No | RC EDL/Executive Datalink 5798-RRZ | Supports up to 99 companies | $12,085-$20,130 |
| **New Generation Software, Inc.**<br>**(916) 920-2200** | Finance/38 | 38, AS/400 | Integrated | GL, AP, AR, payroll, fixed assets | Yes | Financial statements, transaction listings, budget reports, master lists, aged payables/ receivables, government, labor and management reports in payroll | Yes | Yes | Yes | Yes | Yes | Yes | 1-2-3 | Integrated report writing systems, on-line consolidation across companies, outside system interfaces and documentation | NP |
| **Nexus Computer Systems, Inc.**<br>**(803) 271-3076** | Nex GL | 36 | Modular | GL | Yes | Corporate trial balance, detail recap, income statements | Yes | Yes | No | Yes | No | No | None | Combined reports | $850/module |
| | Nex Pay | 36 | Modular | Payroll | Yes | NP | No | Yes | No | Yes | No | No | None | NP | $850/module |
| | Nex AP | 36 | Modular | AP | Yes | NP | No | Yes | No | Yes | No | No | None | NP | $850/module |
| | Nex OI | 36 | Modular | AR | Yes | NP | No | Yes | No | Yes | No | No | None | NP | $850/module |
| **Pansophic Systems, Inc.**<br>**(800) 323-7335** | PM/38 | 38, AS/400 | Integrated | GL, AR, AP, payroll, human resources | Yes | GL report | Yes | Yes | Yes | Yes | Yes | Bar charts, spreadsheets | All | Multicurrency consolidations and translations, AP purchasing matching on-line financial analysis workbench | $15,000-$35,000/ total |
| **Para Research**<br>**(508) 283-3438** | General Ledger | 36 | Modular | GL | Yes | Strategic ratios, company/ division statements, trend reports, trial balance, financial statements | Yes | yes | Yes | Yes | Yes | No | 1-2-3, Easy Calc | Multifunction fields, consolidates up to 49 companies, 12 or 13 period processing | NP |
| | Fixed Assets | System 36 | Modular | Fixed assets | No | NA | NP | Yes | Yes | No | No | No | None | Reports depreciation status, gain/loss on retirement, 2-year depreciation projection | NP |
| | Accounts Payable | 36 | Modular | AP | Yes | Vendor/ duplicate invoice, vendor history, lost discount, voucher distribution report | Yes | Yes | Yes | Yes | Yes | No | None | Multifunction fields, unlimited budgets, intercompany payments | NP |
| | Accounts Receivable | 36 | Modular | AR | Yes | Dunning notices on demand, delinquency reporting, unapplied payment summary, detail by customer | NP | Yes | Yes | Yes | Yes | No | None | Customer search, payment reversals, statements on demand | NP |
| | Payroll | 36 | Modular | Payroll | No | NA | No | Yes | Yes | No | Yes | No | None | Magnetic W-2 reporting, tax deferred deductions, local tables user defined | NP |
| **Prentice Hall Professional Software**<br>**(800) 241-3306** | Financial Reporting | 36 | Modular | GL | No | NA | No | Yes | Yes | Yes | Yes | No | 1-2-3 | Automatic journal entries, prior period/future period transactions, multiple levels of consolidation | $5,000 |

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## PRODUCT SPOTLIGHT

| COMPANY | PRODUCT | RUNS ON IBM SYSTEM/36, 38 OR AS/400 | MODULAR OR INTEGRATED | STANDARD MODULES | INCLUDES A BUILT-IN REPORT WRITER | STANDARD REPORT TYPES PRODUCED | OFFERS USER-DEFINABLE REPORT FORMATS | MENU DRIVEN | ON-LINE HELP | CREATES COMPARATIVE STATEMENTS | POSTS RECURRING TRANSACTIONS | PRODUCES GRAPHS | INTERFACES WITH EXTERNAL SPREADSHEETS/DATABASES | SPECIAL FEATURES | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rand Systems Corp.<br>(313) 855-6877 | Job Costing & Full Accounting | 36, 38 | Modular | Payroll, purchasing, AP, job cost | No | NA | Yes | Yes | Yes | Yes | Yes | No | NA | Presents costs on unlimited subassemblies | $35,000/ total |
| Software 2000<br>(800) 525-0490 | Financial Management 2000 | 38, AS/400 | Integrated | GL, AR, AP, fixed assets | Yes | Querycalc, analytical reports | Yes | Yes | Yes | Yes | Yes | Bar (in AP only) | 1-2-3, interactive spreadsheets | 39-position chart of account numbers, multicurrency processing, each application has own report writer | NP |
| Software Review Corp.<br>(717) 846-0247 | SRCBS | 36, 38, AS/400 | Integrated | GL, AP, AR, order entry/invoice, inventory | No | NA | Yes | Yes | No | Yes | Yes | No | 1-2-3, Dbase III | On-line query | NP |
| Star Software Systems, Inc.<br>(512) 821-6922 | Automated Management System | 36 | Integrated | GL, AP, AR, payroll, job cost, fixed assets, tenant accounting | No | NA | No | Yes | No | Yes | Yes | No | 1-2-3, Dbase III | NP | $6,900-$24,000 |
| Sysgen, Inc.<br>(919) 361-1914 | The 38/Accountant & Human Resource Manager | 38, AS/400 | Integrated | GL, AP, AR, purchase order, fixed assets, payroll, personnel | Yes | Variable list, Flexlist, Sequel, Report Writer | Yes | Yes | Yes | Yes | Yes | Ratio analysis | NP | Native RPG III, user-defined menu/navigation structure, data sensitivity | $12,000-$25,000/ module |
| System Software Associates, Inc.<br>312-641-2900 | BPCS | 36, 38, AS/400 | Integrated | GL, AP, AR, payroll, cost accounting, currency translation, multicurrency, business modeling | Yes | GL, AP, AR, payroll, cost accounting, currency translation, multicurrency, business modeling | Yes | Yes | Yes | Yes | Yes | Bar charts | None | Multicurrency invoice processing, integrated currency translation | $3,000-$30,000 |
| Xerox Computer Services<br>(213) 306-4000 | Xerox Business Management System/38, Xerox Business Management | AS/400 | Modular, integrated | GL, AR, AP, flexible budgeting, financial modeling, payroll, personnel | Yes | Personal reports; standard transaction, balance reports; arithmetic, statistical calculations | Yes | Yes | Yes | Yes | Yes | Histograms | PC-resident spreadsheets | Foreign currency conversions, capital project tracking, full corporate consolidation | $95,000 total |

# Users

FROM PAGE 45

marketing/financial analysis program built around the government reimbursement codes for diagnostic-related groups, a major feature of third-party reimbursement for hospitals.

In addition to hospital management, the production-mode System/38 is used for clinical applications such as pharmacy, order entry, in-house laboratory and surgery and nurse scheduling.

### Modern methods

WWOR-TV in Secaucus, N.J., is typical of the newer IBM mid-range users. While early users of IBM's mid-range machines often wrote their own software because they couldn't find appropriate commercial packages, WWOR relies strictly on off-the-shelf applications.

Under its previous owner, WWOR's data processing was handled by its parent company's DP department. Under its new owner, MCA Broadcasting, Inc., WWOR suddenly had to handle its own data processing on a System/38, according to George Grippo, the station's manager of information systems.

To get running quickly, the station purchased several commercial software packages, including payroll, general ledger, accounts payable and financial reporting. Next year, the station intends to add a purchasing system.

WWOR and Grippo prefer commercial packages. "I'm comfortable with RPG, but we do very little programming," says Grippo, a television industry professional with PC expertise and some familiarity with the System/36.

Grippo may modify some reports but leaves everything else intact. He has found the commercial products to be extremely easy to master. "I put up all the software myself, so that shows you how hard it is," Grippo quips.

WWOR is slated to become the hub of a group of television stations being acquired by MCA. When that happens, Grippo expects the station's DP department to expand to serve its sister stations. At that time, WWOR will look closely at the AS/400. He says he expects no problem transferring his applications.

IBM is presenting the AS/400 as the natural evolution of the System/36 and 38, but for most users it represents a giant leap in computer sophistication.

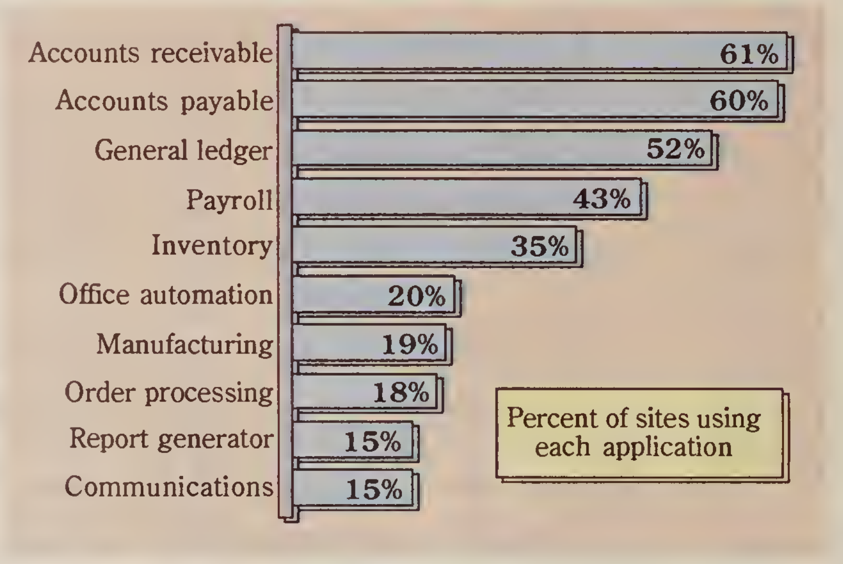
As a leading element in IBM's grand Systems Application Architecture design, the new machine puts the AS/400 user in the forefront of a major computer industry development.

### Welcomes applications

Despite the advanced technological innovation that IBM has put into the AS/400, System/36 and 38 users' primary interest is that the AS/400 easily accepts their existing applications. Developers may be eager to take advantage of the AS/400's extra features, but to System/36 and 38 users, who represent the primary market for the new machine, those advanced features would hold no attraction if using them meant writing off the large body of existing System/36 and 38 applications. •

### Money matters

*Accounting packages led the way in a survey of software use at 18,000 System/34, 36 and 38 sites*



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
CW CHART

# AS/400

FROM PAGE 46

ability to clone other systems. Right now, IBM is only using the interface to clone its System/36 and 38 environments.

However, if IBM could manage to simulate those environments, there may be little to keep it from simulating Digital Equipment Corp., Hewlett-Packard Co. and Honeywell Bull, Inc. environments.

The broad range of processor sizes offered by the AS/400 is also important to software developers. According to American Software's Gable, this range "makes for a much simpler business decision and strengthens an area that has been weak for IBM and strong for DEC."

### Productivity a bonus

Another attraction for developers is the programming productivity that the AS/400 offers. The System/38 has been heralded as being a productive programmer tool.

The AS/400, which contains more than 1.6 million lines of System/38 operating system code, is at least 109 times more productive than the mainframe environment and possibly 30% to 90% more productive than the System/38. The AS/400 provides the ability to extend that ratio even further through the use of the program resolution monitor (PRM).

The PRM, the only real compiler on the AS/400, supports the Machine Interface (MI) language, an AS/400 version of assembler more similar to PL/I than to traditional assembler and allows compiler developers to build their compilers without the need to know the underlying machine. For example, the MOVE operation in RPG, Cobol and other languages will map to the same MI instruction.

This commonality means that the AS/400 will, of all IBM machines, most likely be the most prolific in programming languages. RPG, the traditional language of choice for System/34, 36 and 38 users, will probably remain the language of choice for the AS/400 for now. However, the current release also supports Cobol 74 and 85, RPG-II and III, RPG/400, Pascal, SQL, Control Language, OCL, Basic and PL/I.

### Move from mainframes

System/36 and 38 software developers are not the only potential suppliers for the newly expanded IBM mid-range market. The availability of Cobol 85 will permit the porting of traditional mainframe-only applications to the AS/400. This will also provide smaller companies with more software power.

Whether the mainframe software vendors will leap at the opportunity is debatable. None of their few forays into this market have been notably successful, but System Software's Covey maintains that these vendors will have no choice but to move aggressively to support the AS/400.

"Within one year, it will be obvious to even the most die-hard mainframe advocates that their companies cannot continue to prosper without a significant presence in the AS/400 market." •

# The dynamics of prototyping

*Err on the side of over-management and you have a high-leverage tool at your disposal*

BY MARK TEAGAN
and LIZ YOUNG

Prototyping is not a dirty word. Yet negative stereotypes, unrealistic expectations and fears of losing project control have given it a bad name.

Even those who say they understand it often underuse or misuse prototyping. With no clear requirements definition, the project's real objective eventually gets lost. This lack of discipline results in an expensive and tedious prototyping process in which the prototype itself becomes the goal.

But prototyping can be a viable productivity tool when managed like any other aspect of applications development.

### From start to finish

Prototyping should be treated as a discrete activity with a defined beginning and end. Further, each phase within an application development effort can be handled as a project.

It doesn't matter how many phases there are or what they are called. It matters only that the software developers and end users agree — up front — what the phases are, when each will begin and end and what deliverables will be produced. Whether it is part of the conventional system development life cycle or an entirely different life cycle, prototyping should be considered a project.

Keane, Inc.'s Productivity Management is one management approach and the subject of the book, *Productivity Management in the Development of Computer Applications,* Prentice-Hall, 1985.

Under Productivity Management, users can apply the following six principles to projects, in both individual development phases and for the entire development effort:

- Define the job in detail — both in terms of what work must be done and what products must be delivered.

RENE ZAMIC

- Get the right people involved. Include the appropriate users, particularly during planning.
- Estimate time and costs. Develop a detailed estimate of each phase of the development process before undertaking that phase. Do not estimate what you do not know; explicitly address all assumptions.
- Use the 80-hour rule to break the job down into tasks that require no more than 80 hours to complete. Ensure that each task results in a tangible product.
- Establish a formal procedure for changes and ensure that all parties agree to it in advance.
- Establish system acceptance criteria so that acceptance is a gradual process rather than a one-time event at the end.

### Define the job in detail

People in the field agree that prototyping is inappropriate for batch applications and those that are highly algorithmic. They disagree, especially regarding low-structure applications, about what other types of applications make good prototyping candidates.

The answer is: It depends. It depends on things like the status of your database and the development tools you have available. If, for example, you are developing a low-structure application like an ad hoc inquiry system and you have no database in place, prototyping is probably inappropriate since developing a usable database will constitute a good portion of the effort.

If, however, you have a good database in place, prototyping may be the best way to determine end-user access.

There is, of course, no rule against prototyping part of an application and using the conventional systems development life cycle on the rest.

Defining the job in detail means agreeing on which one of two basic kinds of prototypes will be built:

- Throwaways help users and project developers define systems requirements. These usually become part of the conventional systems development life cycle, replacing written documents with operating models.
- Prototypes ultimately become the final system or part of it. These are normally built with advanced tools and can require a life cycle that differs significantly from the conventional one

If you agree on a throwaway prototype, users and developers must also concur on when the prototype phase will end, how it will integrate into the next phase of the systems development life cycle and precisely what level of detail will be delivered.

That is, they must "bound" it. And to ensure that prototyping doesn't get out of control, users and developers should also agree on when walk-throughs will occur and on the number of iterations to be delivered.

If the prototype is to be one that will either evolve into the final system or become part of it, you must agree on what development methodology you will use and ensure that both users and developers understand what is to be delivered at the end of each phase.

Prototyping a job in detail goes a long way toward allaying user concerns. Take, for example, the systems implementation plans of a large Eastern bank. A new system was to replace one whose subsystem generated 85 different reports.

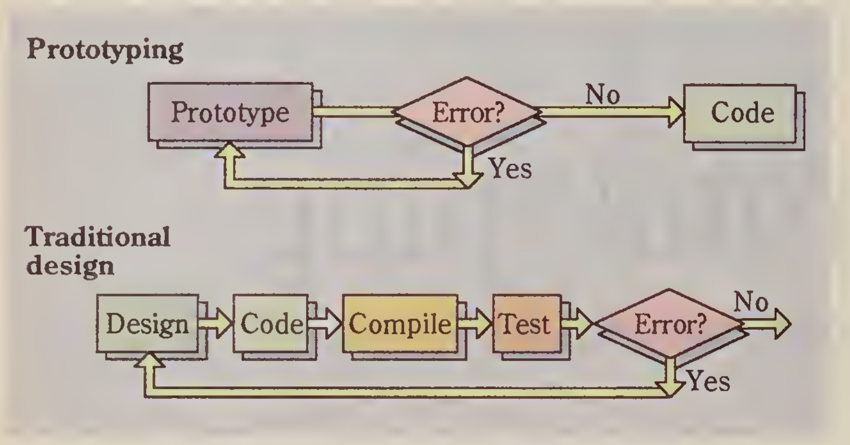
Because this output represented a security blanket to its users, they wanted all 85 reports incorporated into the new

Teagan is marketing manager for Keane, Inc., a national application software company headquartered in Boston and specializing in project management, technical skills and database expertise. Young is manager of Keane's management consulting group.

- **Fears of losing project control**
- **How to get end users committed enough**
- **The 80-hour rule**

**Healthy shortcut**

*Detecting errors at their point of origin, rather than during testing, simplifies correction*



system — even though the analysts estimated it would take 12 man-years to do so.

The analysts estimated that they could cut this effort in half using a relational database management system with an on-line query facility and still provide users with all the information contained in the 85 reports. The users remained skeptical.

### Keeping fears at bay

The developers used prototyping to address users' fears. Relational databases were loaded, actual queries were handled on the prototype system and users got the dramatic proof they needed that this approach would, in fact, meet their information needs.

Perhaps the most important aspect of getting the right people involved is gaining the visible support of a key management person.

Needing to be well versed in office politics, this manager must understand whose jobs will be affected — and how — by new system implementation. The manager must have the authority to make the necessary decisions and the influence to resolve user differences that invariably arise.

If such issues are resolved, prototyping can be a highly effective tool for involving the users, far superior to the use of written documents.

The system developers and users can function as a team to create the best possible system. This kind of give-and-take between knowledgeable developers and involved users ensures realistic expectations from both factions.

Given the stereotype that prototyping involves little more than playing with screen formats, it is easy to underestimate the time users must devote to analysis.

Users' involvement in the early stages will be frequent, and they will have to make decisions on which further iterations are based.

To avoid long turnaround times and the unavailability of decision makers, system developers must evaluate users on their inclination and ability to participate in an intensive process. Developers need to impress upon users the importance of such involvement.

For example, at a large manufacturer, a development team used prototyping to raise user expectations. The users had become convinced, after several failed attempts, that a multifacility labor scheduling system could not be automated because of many seemingly conflicting needs.

A user team was composed of members from key areas in the company and charged with developing screen layouts that would meet the needs of all the firm's plants and operational areas.

Using a screen generator/code generator tool, the team, with the guidance of the developers, discovered that the company's many needs could be accommodated in three screens. When the result was shown to end users at the plants, they too became enthusiastic.

> A COMMON FEAR about prototyping is that it too easily becomes a license to violate standards. Addressing assumptions in writing provides a mechanism for preventing this problem.

### Estimate time and costs

As each phase is completed, enough knowledge about the next phase becomes available so that it can be broken down into 80-hour tasks.

Since each of these tasks can be translated into an accurate estimate, the entire next phase can be estimated accurately. In addition, the estimate for the entire project can be refined and updated.

Because prototyping is comparatively new, it can be difficult to define and estimate as a first phase. It is best to agree to a quick "broad" prototype that then becomes a baseline against which an estimate for the first phase can then be made. This is in perfect keeping with the notion that prototyping works best when the initial model is developed quickly and then updated frequently.

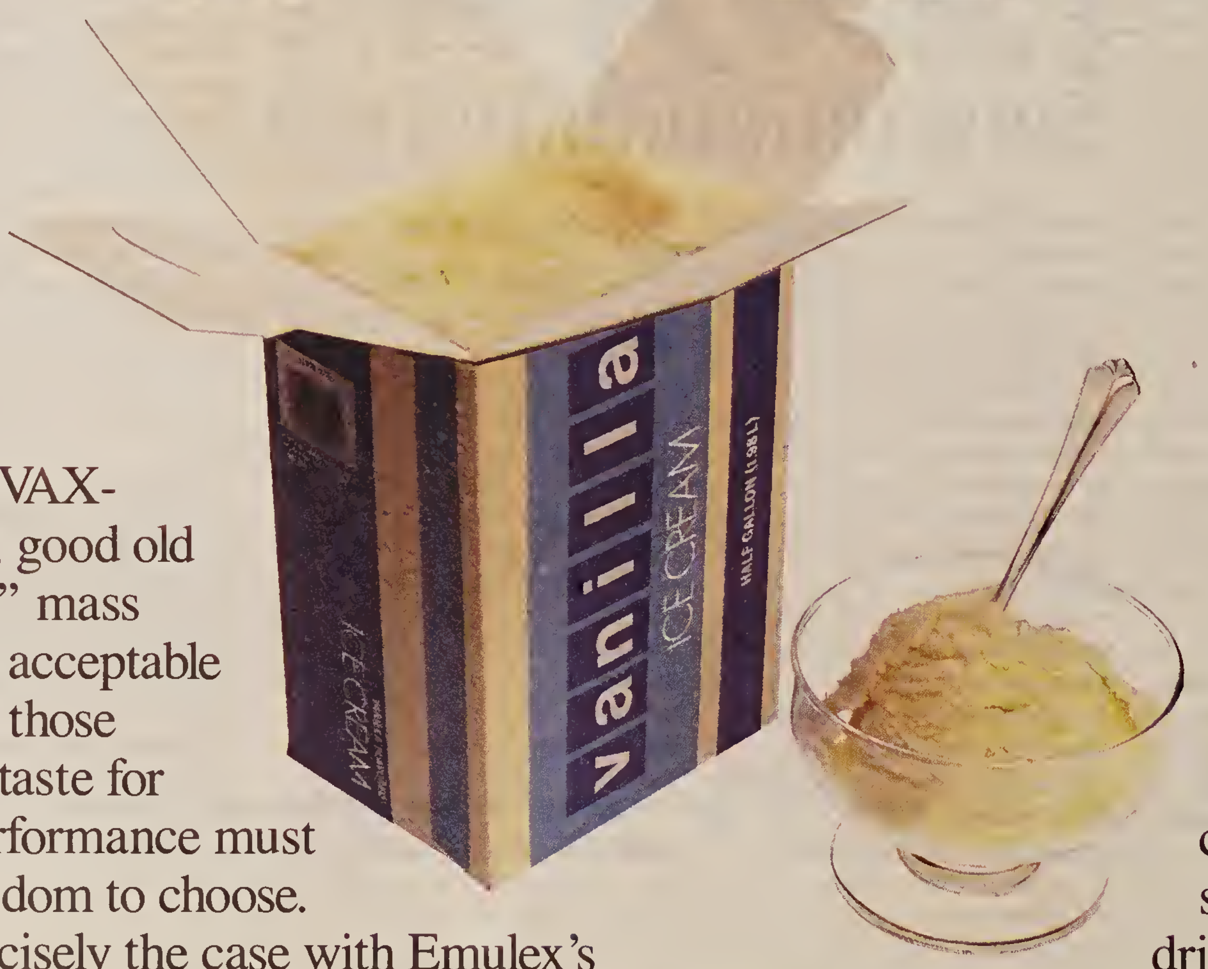
Prototyping does not eliminate the need to evaluate the uncertainties and intangibles that occur in any project environment.

As long as this uncertainty is explicitly addressed, prototyping will normally be a more effective tool than the alternative in reducing the uncertainty in controllable segments.

But risk factors such as large project size, complexity of the

ACCEPTABLE

For some VAX-cluster users, good old "vanilla-like" mass storage is an acceptable solution. But those users with a taste for optimum performance must have the freedom to choose. Which is precisely the case with Emulex's SMDI (SMD-Interconnect) subsystems. SMDI lets you expand storage capacity for all your VAXes...even VAXcluster. SMDI works with the HSC50/70 so that fast, high-capacity industry standard SMD-E drives appear as RA drives to the host. It's multiple gigabytes of storage in space-saving packaging.



technology and the application, volatility of requirements and so forth can be reduced by explicitly addressing assumptions in advance.

There are two types of assumptions: process assumptions — who is to do what, when and with what resources — and product assumptions — what is to be delivered and what is not to be delivered.

While one goal of prototyping is to minimize the amount of paper involved, assumptions should be in writing and signed off. When the assumptions are not in writing, the project manager often finds it difficult to convince management that a problem, such as longer than expected turnaround times, has to be corrected or that an adjustment needs to be made to the estimate.

A common fear about prototyping is that it too easily becomes a license to violate standards. Addressing assumptions in writing provides a mechanism for preventing this problem.

### Use the 80-hour rule

While many tasks will take fewer than 80 hours to complete, it is critical that none take more. At no time should more than 80 hours pass without work being formally monitored.

This approach, along with explicitly addressing all assumptions, helps redress the realistic fears that many project managers have about prototyping's getting out of control.

The 80-hour rule provides the project manager an overview of the magnitude of the prototyping effort. It is used not only in scheduling and estimating but also in assigning work, tracking progress and facilitating user communications.

By imposing many and frequent deadlines from the very beginning, project drifting can be avoided. Finally, effective use of the 80-hour rule virtually guarantees that the other principles of Productivity Management are implemented.

### Changing procedure

While accommodating change is part of prototyping's strength, it can also cause some project managers to fear loss of control. This fear, often legitimate, can be addressed by controlling change during the implementation of prototyped projects, just as it is during the system development life cycle.

All change requests should be submitted in writing. Each should then be evaluated by a designated person who conducts a cost/benefit analysis.

> PROTOTYPING remains underused because of concerns about controlling it, and these concerns arise largely because it has often not been managed.

Because analysis itself can be expensive, its costs should be allocated to a change budget that is agreed to and established before the project starts. No change is implemented unless it is approved in writing.

The spirit of such change control should also be observed during prototyping. If, for example, the end user wants to alter the number of iterations, and this number was previously agreed on, then the changes should be submitted and approved in writing. Their costs should be allocated in a way explicitly defined up front, perhaps in the written assumptions mentioned previously.

### Establish written criteria

System acceptance criteria should be established before coding begins. This has often been difficult with the conventional system development life cycle because users have understandably had trouble assimilating the precise ramifications of requirements and design documents.

Prototyping does much to remedy this problem. By seeing screen layouts, system flow and file structures at the start, users can more readily visualize what they will get.

Since each phase is also a project, Productivity Management advocates that acceptance criteria be established for each phase before it is undertaken. This is most difficult for requirements definition, whether prototyped or done conventionally.

Again, build a quick "broad" prototype that becomes the baseline against which the schedules and estimates mentioned earlier can be developed. It also serves as the yardstick by which users and system developers establish system acceptance criteria.

For example, at a Fortune 500 manufacturing company, users found it so difficult to formulate acceptance criteria that they tried to get the system analysts to write the criteria for drive. The analysts wisely chose to define the job in detail by prototyping on-line capabilities of the proposed system.

This not only enabled end users to visualize the flow and dynamics of the transactions but also provided a vehicle for developing acceptance criteria.

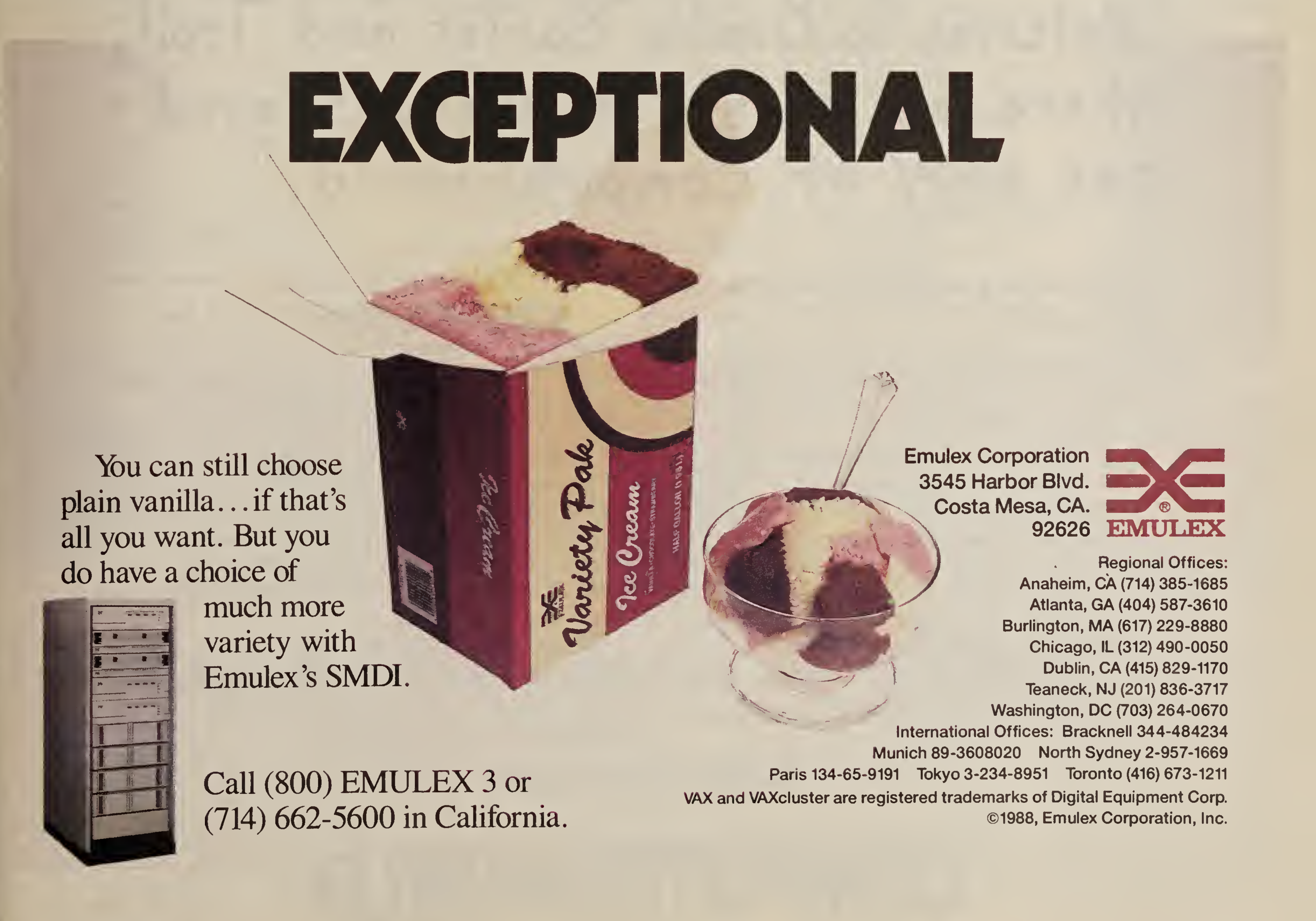
In fact, screen prints, filled out with user-provided data, became a deliverable product of the prototyping phase and a major input for the unit test phase.

### Management beware

Applying a formal project management approach to prototyping may appear to defeat the purpose of this underused productivity tool. But prototyping remains underused because of concerns about controlling it, and these concerns arise largely because it has often not been managed.

Particularly for project teams using prototyping the first time, it is best to err on the side of overmanagement.

In addition, strong management need not be incompatible with the unstructured, give-and-take nature of the prototyping sessions between users and system developers. The role of project management is simply to assure these sessions are part of a productive process. •



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# MANAGEMENT

TAKING CHARGE

*James Connolly*

## Let's get together, now

Systems integration is one of those buzzwords gaining strength as computer vendors talk more about offering "solutions" — a term that will not be used for the remainder of this article — rather than products and as MIS managers cast new roles for themselves.

More and more MIS managers are stepping back to get a broader view of their companies' information needs. Very often, what they see is a need to tie together a variety of systems, not just in the physical sense through networks but in an organizational way with an eye on how information flows from person to person and department to department.

It is clear that MIS executives recognize the value of a unified information management and systems approach — be it a centralized or decentralized strategy. Ask MIS managers about their greatest concerns and they will usually cite challenges such as multiplatform databases, connectivity and getting people to talk with each other.

Of course, they also cite the problem of doing more work with tight budgets, but that is a challenge faced by every type of manager.

The spirit is willing, as illustrated by MIS managers' orientation toward integration, but something is missing. That something may be the technology, or at least the computer vendors' reluctance to use their technology to best serve their

*Continued on page 60*

## Study: Crash hangover keeps turnover low

BY JAMES CONNOLLY
CW STAFF

NEW YORK — The turnover rate for MIS staff has dropped to a five-year low, in part because of prospective job hunters being wary of leaving the security of their current jobs during economic turmoil.

Survey results released last week by compensation specialist Edward Perlin Associates, Inc. showed that average annual professional staff turnover this year is down to 14.5% from 17% in 1987. Perlin officials drew a relationship between the turnover rate and economic problems stemming from the Oct. 19 stock market crash.

"One of the reasons we saw turnover slowing down a bit may be what happened in October. People may be reluctant to leave their jobs at this point," Perlin staff member Peter Tamblyn said.

Tamblyn also cited an emerging trend toward smaller professional MIS staffs, with companies trying to accomplish more work with fewer people. He said professional MIS staffs now average 600 people, compared with 650 a year ago, and he translated that reduction to annual savings of $2 million for each company.

### Few firings

"Staff reductions were achieved primarily through attrition and hiring freezes. We know of very few instances of outright layoffs and firings, but we do know that when an employee leaves, the position may stay vacant for longer than normal," Tamblyn said.

Perlin, which surveyed 47 New York-area companies, found demand slowing for MIS staff but strong for telecommunications specialists.

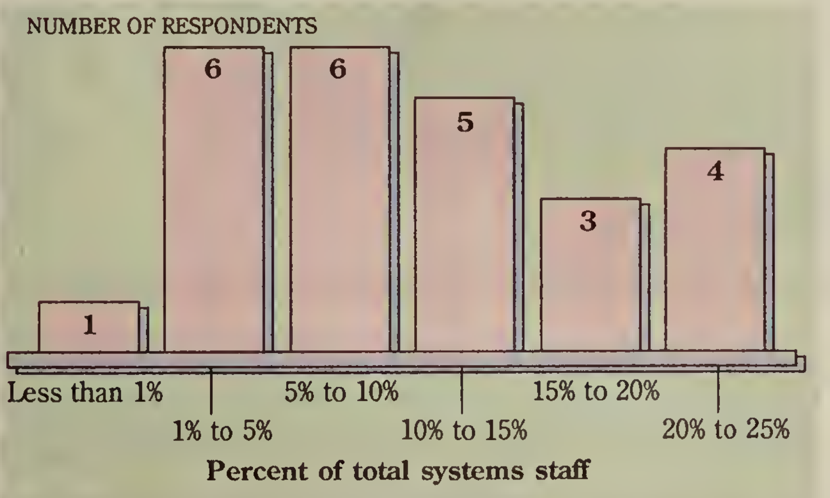
The researchers cited average base pay increases of 14% for telecommunications specialists and 6.1% for other MIS personnel.

Starting pay for entry-level computer-science graduates remained steady at about $26,000.

## Data View

### Leased employee levels vary

*Contractors account for up to 25% of total MIS staffs among 25 Fortune 100 companies surveyed*



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CW CHART

## Melting pot MIS

*Diversity is the rule at conglomerate Emhart*

BY STANLEY GIBSON
CW STAFF

PROFILE

David Dandro

**Position:** *Vice-president of information systems, Emhart Corp.*
**Mission:** *To guide integration of Emhart's varied systems in diverse business units.*

Decentralized and diverse. These are perhaps the best words to describe Emhart Corp. And the adjectives apply equally well to the global conglomerate's data processing operations.

By acquiring and divesting numerous firms, the Hartford, Conn.-based $2.5 billion company has come to possess, as David Dandro, vice-president of information systems, puts it, an "extremely diverse multivendor environment." Dandro's challenge lies in managing the data processed on equipment that bears the label of virtually every computer vendor. Dandro's approach: "I don't really care about the hardware platform. I care what the data is."

The variety of merchandise turned out by Emhart's some 150 units might best be described as everything you might use in the course of a day but probably overlook. It includes plumbing fixtures, golf club shafts, glue, door locks and shoe materials.

But should you be buying a house, you might learn of your future dwelling from an Emhart-owned multiple-listing service. Two Emhart subsidiaries, Planning Research Corp. and Advanced Technology, Inc., are federal computing systems integrators.

Many of Emhart's brand names, such as True Temper and Price Pfister, are more widely recognized than Emhart's own. "It's difficult to talk about Emhart as an entity, and we recognize that and appreciate it," Dandro says.

### To each, its own

Emhart units are computerized with varying degrees of sophistication. Rather than impose a top-down approach on all subsidiaries and divisions, Dandro allows each unit to focus on its particular needs. Some units, particularly those with large computer-aided design and manufacturing needs, have leading-edge systems. Others simply rely on service bureaus.

Dandro sizes up the sophistication of the various local managements to determine how advanced their computer systems can be. In some instances, there are sophisticated people at small Emhart companies; in other cases, there aren't. "We don't want to stuff technology down people's throats," Dandro says.

In this regard, Dandro's approach is not unlike that of Emhart's own toward its merchandise. A case in point: Responding to local consumer preferences, Emhart sells rounded garden shovels in the U.S. and square ones in Ireland.

Although units may express individuality in the systems they use, they must clear any major purchases through Dandro's office, where the MIS director's role is to provide planning leadership and oversight to all Emhart companies. Because Dandro reports to the firm's chief finan-

*Continued on page 60*

MANAGEMENT BRIEFS

## Apollo taken closer to divestiture

There goes another MIS project spinning off into the outside corporate world, although nobody should be surprised by this one. **UAL Corp.**, parent company of United Airlines, moved a step closer to divesting its **Apollo** reservation business recently when the U.S. Department of Transportation approved a planned sale.

UAL said it expects the sale of 50% of its Apollo interest to five other airlines for $500 million to close soon. Under the deal announced in May [CW, May 9], UAL's Covia Corp. subsidiary will own 50% of Apollo, while Alitalia Airlines, British Airways, KLM Royal Dutch Airlines, Swissair and USAir will jointly own the other half.

Maybe there's another Roger Rabbit out there. Animation jumped into the public view this summer with the release of *Who Framed Roger Rabbit*, and now the **National Computer Graphics Association** (NCGA) wants the public to know how computer graphics is emerging as a practical tool for entertainment, business and science. In connection with that, the NCGA is accepting entries in its International Computer Animation Competition.

The NCGA also announced its elected officers for 1988 and 1989, with consultant **Carl Machover** of **Machover Associates** named president-elect beginning Oct. 1 and president effective Oct. 1, 1989. **Joel N. Orr**, president of **Orr Associates**, takes office as NCGA president Oct. 1. **Inge Hutzel**, president of **Computer Graphics Consulting Group**, was elected NCGA vice-president. There will be a runoff election for the post of NCGA secretary between **Gail Arnott Carr** of **Unisys Corp.** and **Ileana Costea** of **California State University at Northridge**.

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# Melting pot

CONTINUED FROM PAGE 57

cial officer, getting a good bang for a buck is always an important consideration.

Since Emhart is an aggregate of small to medium-size companies, the computer systems used by these firms tend to be small to medium-size as well. Dandro rattles off a list of Emhart's vendors: IBM, Digital Equipment Corp., Unisys Corp. (both Burroughs- and Sperry-type systems), NCR Corp. and Honeywell, Inc., to name a few.

Emhart's only IBM mainframe is a 3984 Model Q, running MVS at the corporate data center in McLean, Va. The mainframe handles corporate recordkeeping but also serves as a time-sharing host for outside clients.

The computers that support Emhart's Hartford corporate headquarters typify the firm's attitude toward information systems; that is, to have enough to increase productivity but not more than is needed. The offices are served by a cluster of three DEC VAXs. An Ethernet local-area network connects 125 terminals and 60 to 70 personal computers to the host cluster.

### Within reason

Dandro says he tries to spot places in which investments in MIS can be made but says he is wary of getting carried away. A few years ago, to speed financial reporting, Dandro sent word to all units worldwide to a buy an IBM or compatible PC to file monthly financial results.

"The biggest challenge was to get people to use the PC," Dandro says. But once they did, users began manipulating data and turning their financial results inside out to improve operations, he says. At that time, the PC was the only computing "standard" shared by all Emhart units.

The mandatory review process for each unit's computer purchases often turns up opportunities for volume procurements as each division's needs are pooled to create corporate buying muscle. "We try to find ways to leverage our power against vendors," Dandro says.

Carrying the principle a step further, Dandro has joined with other firms in a communications systems purchasing consortium called American Business Network in Lindhurst, N.J. The limited partnership has the buying power of 40 major corporations, according to Dandro. He estimates that his annual savings on networking equipment is $250,000.

### Change with the times

Dandro brought his leveraging skills to Emhart from the MIS director's position at Borg-Warner Co. in Chicago. He joined Emhart after his predecessor retired seven years ago. At the time, there was no burning MIS problem to solve, just the need to prepare an evolutionary path to the future, he says.

However, Emhart underwent a cultural change two years ago, transforming itself from a quiet but profitable older Yankee company to an aggressive, growth-oriented concern. The change coincided with the accession of Peter Scott to the chief executive officer's position, his mandate for new growth coming straight from Emhart's board of directors.

One year ago, Scott asked for an overview of the firm's information systems. To assist in this, Emhart hired the Index Group, Inc. in Cambridge, Mass. The group has so far recommended that Emhart's information systems be tied more closely to its business strategy. The net result will be to establish a program in MIS that, while not extravagant, does not overlook the opportunity to invest where strategic advantage can be gained.

A large part of Dandro's duties will be to integrate diverse systems. "We want to integrate rather than convert," Dandro says.

In the integration process, constructing a corporate database is a key ambition. A catalyst for this could be personal computers. Intelligence on the desktop has put important data in every office throughout the world. The data must be organized, transmitted and used.

"Before, we used to have just mainframes and minis," Dandro says. "Now, we have micros, mainframes and minis. There are exciting opportunities to integrate."

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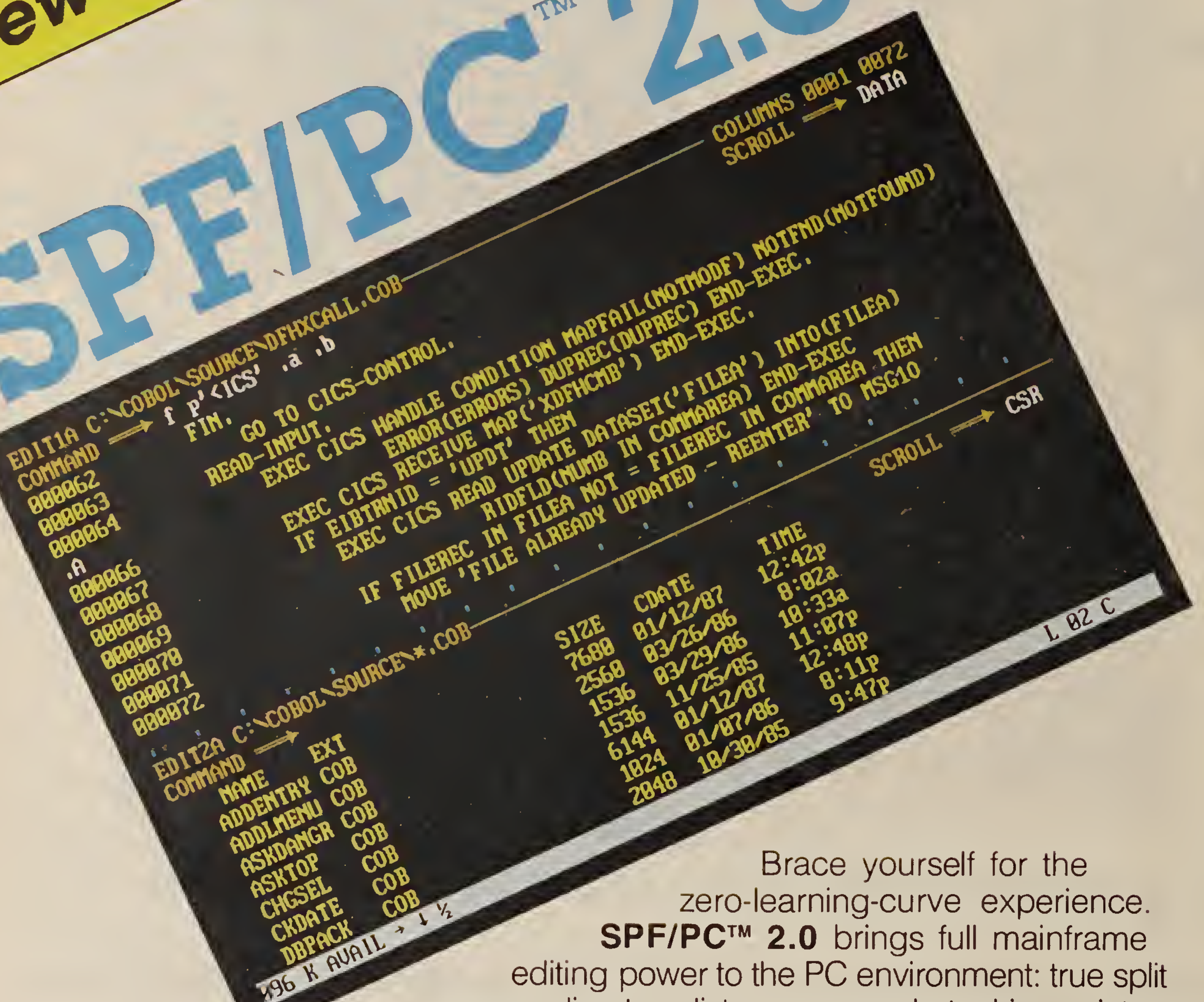

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COMMAND ===> f p'<ICS' .a .b                          SCROLL ===> DATA
000062        FIN.
000063            GO TO CICS-CONTROL.
000064        READ-INPUT.
.A            EXEC CICS HANDLE CONDITION MAPFAIL(NOTMODF) NOTFND(NOTFOUND)
000066                  ERROR(ERRORS) DUPREC(DUPREC) END-EXEC.
000067            EXEC CICS RECEIVE MAP('XDFHCMB') END-EXEC.
000068            IF EIBTRNID = 'UPDT' THEN
000069               EXEC CICS READ UPDATE DATASET('FILEA') INTO(FILEA)
000070                    RIDFLD(NUMB IN COMMAREA) END-EXEC
000071               IF FILEREC IN FILEA NOT = FILEREC IN COMMAREA THEN
000072                  MOVE 'FILE ALREADY UPDATED - REENTER' TO MSG10
EDIT2A C:\COBOL\SOURCE\*.COB -------------------------------------------
COMMAND ===>                                           SCROLL ===> CSR
       NAME     EXT      SIZE   CDATE     TIME
       ADDENTRY COB      7680   01/12/87  12:42p
       ADDLMENU COB      2560   03/26/86   8:02a
       ASKDANGR COB      1536   03/29/86  10:33a
       ASKTOP   COB      1536   11/25/85  11:07p
       CHGSEL   COB      6144   01/12/87  12:48p
       CKDATE   COB      1024   01/07/86   8:11p
       DBPACK   COB      2048   10/30/85   9:47p
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# Connolly

CONTINUED FROM PAGE 57

customers. Companies can reorganize the heck out of their MIS groups and user departments, but if one system won't talk to the other, it is like having one person talking into a tin can while the other uses a telephone.

The frustration that MIS managers feel is exemplified in a study conducted by the Hubbard Research Division of Corpcom, Inc. in Chicago. Hubbard surveyed managers in 244 Fortune 1,000 companies and found that 85.7% would like seamless integration of all software and hardware systems. In addition, 71.3% of the respondents felt significant pressure to integrate those systems.

However, 58.2% of the managers said the current ability of computer software systems to integrate is poor, while 34.8% rate that ability as manageable.

Maybe vendors that tout the value of integration have to look first at their own offerings and place less emphasis on selling managers on the value of unified systems.

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Connolly is *Computerworld's* senior editor, management.

# COMPUTER INDUSTRY

INDUSTRY INSIGHT

*Andrew Mohr*

## DOD's summer freeze

Aristotle once said that luck is the man standing next to you getting hit by an arrow. It all depends on where you are standing when something bad happens.

It's the same for the freeze that the U.S. Department of Defense recently imposed on the acquisition of data processing goods and services. The freeze is something bad; a random arrow no one expected. Depending on where a vendor stands, however, the freeze can either have little effect on sales or slash them.

The DOD imposed the freeze in May because its cash outlays exceeded its budget by some $4.5 billion. The freeze directs DOD activities to defer ordering nonessential goods and services, including DP. Specifically identified for deferment are personal computers, software development, office automation, office supplies and information technology. Exempted from the freeze are "mission-critical" goods and services that would affect the direct readiness of U.S. armed forces.

The freeze is a quick fix to the department's overspending. It does not necessarily reflect a decrease in the DOD's DP budget. However, the freeze was recently extended to the end of

*Continued on page 62*

# Rolm immersed in IBM culture

*Telecom subsidiary has swapped independence for giant's deep pockets*

**ANALYSIS**

BY KATHY CHIN LEONG
CW STAFF

SANTA CLARA, Calif. — The changes were subtle but significant when much of the authority over IBM's Rolm Systems operations was transferred into the hands of IBM executives.

As part of IBM's move to streamline its own operations, the parent reorganized the manufacturing arm of its Rolm subsidiary. Rolm lost its divisional status and is now known simply as Rolm Systems. The changes underscore IBM's plan to bring the telecommunications subsidiary under its rule.

IBM acquired Rolm in November 1984 and had then promised that Rolm would maintain its entrepreneurial spirit. However, several veteran Rolm employees interviewed said the Rolm culture, which had fostered independence, has been replaced by bureaucracy.

"This last manufacturing move was expected," one staff engineer said. "The Rolm name will probably disappear within a year. I keep seeing IBM signs being put up all over the company." The IBM logo is already replacing Rolm's on most products.

But the latest change has not shaken the once-independent company. "We are getting used to it by now," the engineer said. The technical talent pool is still there, he added, "but it is a very unmotivated talent pool."

While much of the Rolm culture — such as its 12-week sabbaticals and emphasis on pride of product ownership — will be missed, analysts said IBM has rescued the company, which is the No. 3 vendor in the private branch exchange market. According to Dataquest, Inc. analyst Greg Carlsted, Rolm would have steadily lost market share if not for the deep pockets of IBM.

"IBM had to intervene to get Rolm back on track," he said. "There is a lot of pain for Rolm employees to go through in

*Continued on page 63*

# Those go-go software mergers

BY NELL MARGOLIS
CW STAFF

FORT LEE, N.J. — *Let's Make a Deal* continued to be the name of the game in software and services during the first six months of this year, according to the recently released mid-year ADAPSO/Broadview mergers and acquisitions report.

Issued by Broadview Associates, an investment banking firm based here, the report showed corporate combinations going three ways: bigger, better and everywhere.

"If there is any softness in this market, we're certainly not seeing it," said Broadview partner Gilbert Mintz. "What have driven mergers and continue to drive them are valid strategic decisions to position companies with regard to new markets."

Eleven deals were consummated for $100 million or more in the first six months of this year, according to Broadview — more than in all of 1987. Of these, Dun & Bradstreet Corp.'s $1.6 billion buy-out of health care market information purveyor IMS International logged in as the second largest services and software acquisition ever, exceeded only by the 1984 General Motors Corp.-Electronic Data Systems Corp. deal.

The total number of deals was up 39% from 137 in the first half of 1987 to 190 between this past January and June.

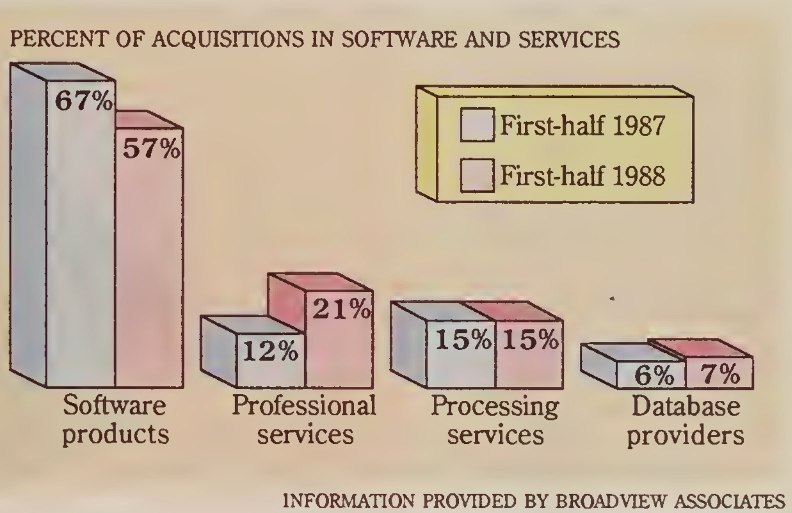
The trend toward internationalization noted by Broadview in past reports continued apace, according to Broadview partner Charles Federman. While foreign acquirers still have the exchange rate advantage, he noted, U.S. companies are also showing interest in acquiring their way into worldwide markets.

One new trend noted by Broadview is a quickening of interest in professional services companies. Software products companies still accounted for the lion's share of the action — 57% of the total number of deals — but this figure dropped from last year's 67% mid-year figure. In contrast, acquisitions of professional service firms jumped from 12% to 21% at this year's mid-year count.

Mintz attributed the jump to corporate buyers who are realizing that end users want services to complement products and that the offer of one-stop shopping is a draw not to be overlooked. Among professional services firms, those most likely to be targeted by an acquiring firm are "basic body shops with good geographical spread and strong marketing capabilities and specialty shops that can offer services in areas such as banking or brokerage," he said.

**Acquisitions abound**

*Software products vendors continued to be the favorite buy in the software and services sector, but professional services firms saw the greatest growth spurt*



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CW CHART

# Fibronics seeks elusive profit in fiber optics

BY JAMES DALY
CW STAFF

HYANNIS, Mass. — Fibronics International, Inc. President John Hale must sometimes feel like the first guest to arrive at the party of the century. Invitations have been sent and attendance promised, but the fun does not start until the crowd arrives.

With the emerging Fiber Distributed Data Interface (FDDI) fiber-optic standard steaming toward acceptance and research firms predicting a $3 billion fiber market by 1992, the industry's move toward fiber-optic communications seems inevitable.

But despite the hosannas from those who see a pot of gold at the end of fiber's rainbow, 11-year-old Fibronics still cannot shake one simple fact: It has not made an annual profit in five years as a public company.

### Winds of change

Now this is about to change, Hale recently assured *Computerworld.* "The losses and difficulties are correctable, and we won't have to break the laws of accounting or science to do it," said the president of the fiber-optic data communications equipment maker.

Times were not always hard at Fibronics. Founded in 1977, the company expanded considerably through 1985. But in early 1986 it purchased Spartacus, Inc., a development-stage systems house that siphoned off dollars and initiated a string of losing quarters. A $2 million loss on $30.1 million in revenue in 1986 mounted to $2.8 million on $36.5 million in 1987.

Soon after Hale came on board in February, he began to stem the overexpansion that had helped land the firm in the fiscal doghouse. Senior management's pay was immediately trimmed 10%. Overtime was reduced. And Fibronics' work force was cut by 81 employees to 420.

One cash absorber, however, remained untouched. "A large amount of R&D money and talent was spent on FDDI development, but it was not money that was thrown away," Hale said. "We're basing a whole line of products on those investments."

Certainly, Fibronics has done its share of FDDI trailblazing. Its System Finex network was one of the first to implement the still-unfinished FDDI standard.

Still, the company will not let its future hang by a fiber-optic thread. "In order to invest in FDDI, we've got to be profitable from other product lines," Hale said. "Our cabling systems, local-area networks and Spartacus products in CPU connections deliver most of our revenue now."

Fibronics has also looked at overseas markets and recently signed two major deals in Europe: a million-dollar pact to provided System Finex to the Italian highway system and another to install the UK's first 100M bit/sec. local-area network at University College in London.

The firm also hopes to exploit the federal government's acceptance of the security, speed and load capability fiber offers. Only 10% of the company's revenue now comes from the federal sector, but eight months ago, Fibronics opened a sales office specifically tailored to government work, and Hale said he expects federal monies to make up "a good part" of future revenue.

# IN BRIEF

## Shift at HP

**Hewlett-Packard Co.** Executive Vice-President and Chief Operating Officer Dean O. Morton refocused his responsibilities solely on HP's computer business in a management shift last week. Morton had been responsible for test and measurement products as well; those functions will now report directly to HP President John A. Young.

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## Paradyne layoffs

**Paradyne Corp.**, still struggling to regain profitability, will reduce its worldwide work force by 10% through layoffs and other measures. About 300 jobs will be eliminated at the Largo, Fla., data communications vendor.

......

## On-Line quarterly loss

As expected, **On-Line Software International, Inc.** announced a hefty fourth-quarter loss that stripped its earnings for the year to $700,000, compared with $4.9 million in fiscal 1987. Annual revenue climbed 29%, to $81.9 million. On-Line lost $4 million in the quarter ended May 31 on sales that dropped 12% from year-earlier levels to $18.8 million. Year-earlier profit in the fourth quarter was $1.7 million.

......

## CDC gets credit

For the first time since surviving its fiscal crisis in 1985 and '86, **Control Data Corp.** has established a credit line with a group of U.S. banks. Bank of America is the lead bank of nine institutions providing a $225 million credit facility.

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## Goal to buy Altai

Software suppliers **Goal Systems International, Inc.** and **Altai, Inc.** have signed a letter of intent for the merger of Altai into Goal. Under the $14 million agreement, Columbus, Ohio-based Goal will pay $5.75 for each outstanding share of Dallas-based Altai.

# Mohr

FROM PAGE 61

the government's Sept. 30, 1988 fiscal year. Since the DOD's spending for supplies peaks during the fourth quarter, the freeze will hurt contractors who were looking to boost sales in August and September.

Most affected by the freeze are manufacturers and resellers of plain-vanilla office automation and microcomputer products. These procurements are easy to spot and hard to justify for an exemption from the freeze. While DOD activities — buying more sophisticated or specialty products — can obtain waivers from the freeze, it's harder to justify buying a few personal computer clones or 10 more copies of Lotus' 1-2-3 as mission-critical.

Vendors of mainframe and minicomputer products are hurt much less, as are systems integrators. These contractors generally sell the bulk of their product through requests for proposals, which are flexible contract procedures that often take six months to a year to complete. Because of their long gestation periods, it is easier to stretch out negotiations, benchmarking and contract awards until after the freeze ends.

Computer services firms are generally weathering the freeze as well. It is harder to summarily cut off a service contractor providing a needed, day-to-day service, or stop a software developer in the middle of a project than it is to defer buying some

How Ameritech helped Bank One

more micros.

Maintenance vendors are for the most part safe, since they operate under ongoing annual contracts that bridge the freeze. However, since the freeze does prohibit the placement of new maintenance contracts, a maintenance vendor could be hurt for those contracts coming up for renewal during the freeze.

For most vendors, the freeze will be at worst a dry spell, a slight dip in expected sales, if noticed at all. For others, the freeze will be a lot worse, a drought. It's just a matter of where you are standing when the random arrow strikes.

---

Mohr is a partner at the law firm of Cohen & White in Washington, D.C., specializing in the federal procurement of DP goods and services.

## Rolm

FROM PAGE 61

changes, but the handwriting has been on the wall for a long time."

The manufacturing moves follow the March 1987 absorption of the entire Rolm sales force into the IBM sales group. Rolm insiders said the next to be merged will probably be marketing and finance, completing the integration of the company into the IBM fold.

Under the new structure, instead of reporting to Rolm headquarters in Santa Clara, the Colorado Springs manufacturing site for Rolm computerized branch exchange digital switch cards will report directly to the IBM Systems Technology Division in Charlotte, N.C.

The Colorado Springs manufacturing for Redwood, a small switch, will move over to an IBM plant in San Jose, Calif. Also moving to the San Jose plant will be some 700 manufacturing workers who worked at the Rolm facility in Santa Clara.

Rolm's Austin, Texas, site will report to the IBM Entry Systems Division, but development will remain in Santa Clara. By losing its divisional status, Rolm has more of a supporting role in the IBM picture. Carlsted predicted that Rolm will eventually become another research and development lab.

While IBM announced last month it is consolidating its north-central and southwest marketing divisions, an IBM spokesman said the news has no impact on Rolm.

## Lives and times

Rolm Corp., founded in 1969, was one of the success stories of Silicon Valley as the maker of the first digital private branch exchange. The letters in the company moniker are the first initials of the last names of the four founders.

Today, two founders remain with Rolm while the other two are pursuing their own interests.

**Gene Richeson**: The R in the equation, Richeson is a full-time volunteer and cofounder of the nonprofit nationwide agency Beyond War. The group, which believes war is obsolete, is described as an educational foundation that promotes goodwill and resolution without war.

**Kenneth Oshman**: The former president, who departed in 1986, is a personal investor and will be teaching undergraduate classes in business management at the University of California at Berkeley in the fall.

**Walter Loewenstern Jr.**: Loewenstern served as Rolm's vice-president for administration and personnel. Today, he is employed at what is now the Rolm Systems division as a part-time company consultant.

**Robert Maxfield**: Maxfield is the sole cofounder who still works at Rolm on a full-time basis. As director of Rolm Systems, he advises the company on technical issues.

KATHY CHIN LEONG

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# COMPUTER CAREERS

# C programmers need not apply

*Demand for the language hot in software development, cooler in MIS*

BY ALAN RADDING
SPECIAL TO CW

In the world of computer software product development, C language is a hot skill for programmers. It is the overwhelming choice in development of personal computer- and Unix-based systems, making C programmers a highly sought-after breed.

"Never before have we had such a clearly dominant language in the development area," says Robert Kleven, president of Robert Kleven & Co., a Lexington, Mass.-based high-technology recruiter.

Corporate MIS departments, however, have not developed a similar hunger for C language programmers and continue to rely on traditional programming languages. "It is my understanding that the demand for C programmers in the typical corporate MIS department is slim to none. The dominant language is still Cobol," Kleven says.

### Beyond the borders

Software vendors cannot find enough C programmers to fill their needs and have begun to search worldwide, says Lee Silver, president of L. A. Silver Associates, an international high-technology recruiting firm based in Framingham, Mass. Silver is heading to London in an effort to find 140 C/Unix programmers for a major vendor. "I won't be able to find all of them offshore, but I will find some," Silver says.

But Silver says he does not expect the insatiable demand for C programmers to last long. "It's a temporary thing. The schools are pushing out C programmers. The companies themselves are gearing up. I think the shortage will last two to three years," he says.

Gary Weischselbaum, manager of software recruiting at New Boston Associates in Woburn, Mass., is advertising for C programmers for his software developer clients.

But while Weischselbaum is beating the bushes for C experts, his colleague, Dennis Travers, New Boston's manager of MIS recruitment, finds demand for C programmers within MIS virtually nonexistent. "Every now and then we get a request for C. Maybe somebody bought a super PC and wants to put something with Unix on it," Travers says. He cannot recall the last time he placed a C programmer in MIS.

Like Kleven, Travers continues to find the demand from MIS to be primarily for Cobol and CICS programmers. As MIS gets more deeply involved in distributed and end-user computing, he says he anticipates increased interest in C programmers.

There may be modest opportunities for C programmers within ancillary MIS activities. "Take a large bank," Kleven says. "It needs an army of Cobol programmers, but then it might need a few programmers to be specialists in office automation, transaction processing or networking." These applications could be moved onto mini and microcomputers and require the support of some C language programmers, he says.

> "MY FEELING is that [the C language] is a very narrow area. When I advise people, I warn them not to get into a box."
>
> JOHN ERDLEN
> MANAGEMENT DIMENSIONS

### Maintenance men

Kleven also suggests that if Unix-based workstations become established in the data processing environment, users might want their own C programmers for maintenance. Opportunities for C programmers might also come in MIS shops that are heavy users of PCs or that operate a major PC information center.

Unlike a product development organization, an MIS department is unlikely to need a highly skilled C programmer on short notice, Kleven says. If an MIS department does need a C programmer, it has several options that are less costly than competing for them with product development companies. "An MIS department would probably try to retrain somebody internally or pick up an entry-level C programmer from college," he suggests.

Other computer recruitment professionals share Silver's view that the demand for C programmers will be a short-lived phenomenon even in the development world, and C programmers risk being left behind when the industry moves onto the next hot language. "My feeling is that [C language] is a very narrow area. When I advise people, I warn them not to get into a box," says John Erdlen, president of Management Dimensions, Inc., a Wellesley, Mass., outplacement career counselor.

One problem of programmers who concentrate in a language that is too specialized or have a skill that is only in demand for a short time is that they price themselves out of the market, Erdlen warns. "A few entrepreneurial companies may pay big money for a C programmer now, but what's he going to do next?" he asks.

### Generalists preferred

The preferred career path for a programmer who wants to move up in an organization is to master a variety of skills and languages while keeping current with industry trends, Erdlen says. The career path is much better for a programmer with five years of general experience and only six months of C language programming than for someone who has only three years of C language work, he says.

Even in the product development community, top C programmers are expected to bring strong product development experience with them along with their programming skills.

For example, a C programmer with five years of varied development experience can earn as much as $50,000 a year, but a person who only has programming skills earns much less. "If you are just a programmer, you are much more junior and you have less marketability," Weischselbaum advises.

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Radding is a Boston-based author specializing in business and technology.

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## PROGRAMMERS

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## SOFTWARE ENGINEER

For S. Fla., to develop, design, evaluate productions and experimental avionics products, components or special test equipment; prepare technical material for projects, status reports and coordinate work of technical personnel. Must have MS in Computer Eng. Salary for 40 hr week Mon-Fri 8 a.m. - 4:30 p.m. is $33,000 yrly. Send resumes to: Job Service of Fla., 105 E. Broward Blvd., Ft. Lauderdale, Fl. 33301 Attn: Job Order #FL 5793376.

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### INFORMATION ADMINISTRATOR
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**$35,126 - $45,390 annually**

*Closing date must be received by 4:30 PM August 22, 1988*

Applicants should obtain a job announcement and original application form from The Pierce County Personnel Department, Room 1A-127, County City Building, Tacoma, WA 98402. Job Service Phone (206) 591-7466. Resume in lieu of application is not acceptable. PIERCE COUNTY IS AN EQUAL OPPORTUNITY EMPLOYER.

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We have immediate openings for senior programmer analysts with a minimum of 4 years experience with one of the following skills; 1) IMS, DB/DC, ADF, SQL, DB2, Telon 2) IBM/PC's, PS/2, VM, OS/2, C lang., windows 3) COBOL, Mark IV, DMS, CMS, System 2000 4) COBOL, FOCUS, CICS, IDEAL, ADR/DATACOM 5) FORTRAN, GKS, VMS, CMS, Computer Graphics, UNYSIS 6) COBOL, IDMS/ADS/O, ADABAS, Prime 9000 Series. These positions are available in Houston TX, St. Louis MO, Tulsa OK. Minimum assignment 1 year. No collect calls, no trainees, no part time. We offer a major medical plan, our rates start at $30/hr., For career opportunities please send resume to:

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## VAX COBOL PROGRAMMER/ ANALYST II

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One quick phone call can give you all the information you need on running your recruitment advertising in up to eight leading industry newspapers. And if you hurry, you can still get in on the special low introductory offer!

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# Where do the best computer professionals look for jobs?

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Computer Systems Analysts

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Applicants need a solid knowledge of:

- IBM Hardware — 9370-60/4361
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For more information call toll free 800-327-8220 or send resume to W.J. McMahon, P.O. Box 109600, Mail Stop 710-18, West Palm Beach, FL 33410-9600. Equal Opportunity Employer, M/F.

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## *The University Of Chicago Computing Organizations*

Administrative and Library Information Systems (ALIS) is a new University department charged with planning and development of the University's major administrative and library applications. Current technical environment includes MVS/XA system with Model 204, PL/I, and COBOL/CICS applications; future work will include C/INGRES under VAX/VMS as well as Macintosh and MS/DOS interfaces.

Three senior-level positions reporting to the director of ALIS are currently open. Two emphasize excellent analytical and system planning skills, the third must provide outstanding technical skills and leadership in applications development. All require energetic individuals with excellent communications skills and a commitment to quality.

Qualified candidates should send a resume with salary history and the names of three references to:

**DAVID TREVVETT, Director**
Administrative and Library
Information Systems
*THE UNIVERSITY*
*OF CHICAGO*
1155 East 60th Street
Chicago, IL 60637

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**Engineering Consultants for Chicago and Columbus requires:**

* B.S. in Computer Science; M.S. a plus
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  - Call processing software design and development
  - Switching system requirements and architecture
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  - Operating systems development, and local area networks

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* (3-5) years minimum working experience in any of the following areas:
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Applied Computer Analyst; Job duties: develop software, integrate systems & consult with research faculty; design functional specifications, develop & support structured software for image analysis & processing systems; design & support data-acquisition systems for laboratory instruments using interfaces, programming & communication software; train faculty & staff on custom developed software. Other requirements: experience in Pascal, C & FORTRAN, image processing, data acquisition systems, pictorial information systems, pictorial information systems, and programming real time systems. BS in Computer Science with 3 yrs technical programming experience. Salary: $26,000/yr; 40 hr/wk; Send resume to: Mr. Jack Hilzheim, Tennessee Employment Security, 1309 Poplar Ave., Memphis, TN 38104. EEO/AA.

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DATA PROCESSING

The City of Colorado Springs currently has the following openings:

### SYSTEMS ANALYST II

Position analyzes and documents various information systems; adapts moderately complex information systems to automated data processing; provides consultative systems guidance to the user in the application of systems analysis to business problems; integrates technical data as it relates to data processing machine logic. MUST HAVE: Option 1: Bachelor's degree in CS, MIS or a technical field involving computer science course work; three years of data processing experience involving the analysis, design, and programming of automated systems. Option 2: Bachelor's degree; four years data processing experience involving the analysis, design, and programming of automated systems; or an equivalent combination of education and experience. Specific licenses, registrations, certifications, etc., may be approved as minimum qualifications by Dept. of Personnel upon evaluation of specific position requirements. DESIRABLE: Proficiency in COBOL; experience with IBM 43XX or 30XX mainframe computers, MVS/XA, CICS/VSAM file organization, IBM Utilities, especially IDCAMS, TSO/SPF/SDSF, Screen Mapping Facilities, IBM OS JCL; experience with large automated human resources and financial applications vended packages. SALARY: $2523-2920.

### PROGRAMMER ANALYST
(2 Positions)

Position interviews functional/user area personnel to assess proposed system cost/benefit possibility and information requirements. Programs flow charts, block diagrams, report layouts, detailed program designs and documentation using current design technique or functional program specifications. MUST HAVE: Option 1: Bachelor's degree in CS, MIS or technical field involving computer science course work; two years applications programming experience involving use of COBOL. Option 2: Bachelor's degree, three years of applications programming experience involving the use of COBOL; or an equivalent combination of education and experience. DESIRABLE: Proficiency in COBOL; experience with IBM 43XX or 30XX mainframe computers, MVS/XA, CICS/VSAM file organization, IBM Utilities, especially IDCAMS, TSO/SPF/SDSF, Screen Mapping Facilities, IBM OS JCL; experience with large automated human resources and financial applications vended packages. SALARY: $2371-2745.

A City application is required and may be obtained by contacting 719-578-6686. Application must state position title/code and be received by Friday, September 2, 1988 at the City of Colorado Springs, Dept. of Personnel, Attn: Position No. W-22 (Systems Analyst II), W-2200 (Programmer Analysts), P.O. Box 1575, 30 S. Nevada Ave., Ste. 105, Colorado Springs, CO 80901-1575. Application office hours are 9 a.m. to 5 p.m., Mon., Weds., & Fri. We are an Equal Opportunity Affirmative Action Employer.

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## Systems Programmers & Programmer/Analysts "Nationwide"

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| MVS/XA Sys Prog (Gens/Planning) | $48K |
| IOMS or IMS Prog/Analyst (Mfg Apps) | $39K |
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| MSA Prog/Analyst (Fin Apps/COBOL | $39K |
| NCP/VTAM Sys Prog (Gens/Tuning) | $46K |
| CICS or DB11 P/A (Mfg Apps/COBOL) | $40K |
| ASSEMBLER Prog Analyst (Fin Apps) | $38K |
| LIFE/COM or 'IFE/70 P/A (Ins Apps) | $42K |
| BANKING Prog Analyst (COBOL MSA) | $38K |
| INSURANCE Prog Analyst (COBOL/PMS) | $42K |

Please send resume to Robert Montgomery or call 919-787-4205

*The Data Group*
P.O. Box 52055
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SYSTEMS ANALYST-ALGORITHM DESIGN & ANALYSIS (Rochester, NY) · Evaluate & design applied mathematical models for telecommunications systems. Perform network optimization & analysis of data structures, performing programming & implementation of aforementioned methods. Perform emulation of algorithms for math models in telecommun, environment. Equipmt to be used: DEC, MVME (Motorola Bus Environment). Must know: FORTRAN, RSX-11-M, LISP, machine & Assembly languages, VAX/VMS, optimization of algorithms & statistical methods for data processing. Req: Master's - Comp Sci.; 2 yrs exp or 2 yrs rel exp - research in algorithms or position encompassing algorithm design & analysis. $38,000/yr, 40 hr wk. Send resume only in DUPL to: S. VanDempen, Job Service, 140 W. Main St., Rochester, NY 14614. Job #NY0204277.

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Required by the
WORLD FOOD PROGRAMME
at its Rome Headquarters

# CHIEF, USER SUPPORT UNIT, INFORMATION SYSTEMS SERVICE

The World Food Programme (the Food Aid Organization of the United Nations System) has a vacancy at its Rome Headquarters in the Information Systems Service for a qualified person who will act as Chief of the User Support Unit. Applications sought from persons with a University Degree in Computer Science, Mathematics or related field and seven years progressively responsible professional experience in the computer field with particular emphasis on **User Support** including some years at supervisory level.

Experience should include knowledge in areas of both **Mainframe** and **Microcomputers**, as well as management of training programmes in these fields. International experience an asset.

The initial appointment will be for three years, with posibility of renewal. Starting salary, depending on qualifications and experience, will be from US$30,275 to US$39,761 net, tax free, plus allowances, cost of living adjustment, relocation grant, education grant and other benefits of the International Civil Service. Duty station: Rome, Italy.

Full curriculum vitae should be addressed to: The Director of Personnel, World Food Programme, Via Cristoforo Colombo 426, Rome 00147, Italy.

Correspondence should be postmarked by 31 August 1988, quoting Vacancy Announcement MS-88-44.

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## AS/400 OPPORTUNITY
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Divisions of Mobil Chemical Company headquartered in the Rochester, New York area have an outstanding opportunity for a Systems Professional.

This person will participate in new system design, lead the program development effort and provide programming support on our existing AS/400. Requirements include significant experience developing systems applications on the IBM System 38 using RPG III as well as excellent communications and interpersonal skills. This project is an integral part of our national Distribution Management System.

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**Pittsford, New York 14534**
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### S/38
### SR. PROGRAMMER/ANALYST

Data processing service company seeks candidate with 5+ years experience for support of existing customers. Strong data communications background required. If you have the above requirements, have good communication skills, and would like to work for a growing company in the Rocky Mountain region send your resume and salary history to:

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# Information Systems

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Ernst & Whinney, the international public accounting and management consulting firm, is significantly expanding its Mid-Atlantic information systems consulting staff. We seek information systems professionals with 2-8 years of consulting or industry experience in manufacturing, health care, textiles, financial services or insurance. A Bachelor's degree is required, and advanced degrees and relevant industry professional certifications are desirable.

If you are interested in accelerating your career growth by joining Ernst & Whinney's growing information systems consulting practice, you should have experience as a COBOL programmer, programmer/analyst, systems programmer, systems analyst, project leader or MIS manager in a large IBM mainframe environment. In addition, you should be experienced in one or more of the following service areas:

- Management of Information Systems
- Information Systems Planning
- Information Security
- Operations Management
- Hardware/Software Selection and Implementation
- Custom Software Development
- Fourth Generation Tools and Rapid Prototyping
- Telecommunications and Networking
- Operating Systems Software
- Database Management Systems

Ernst & Whinney offers an excellent compensation package and significant opportunities for increased responsibilities leading to Partnership. You will be guided by proven methodologies and supported by the education necessary to help you provide the highest quality service. Opportunities are available throughout the Mid-Atlantic Region in cities such as Charlotte, NC, Pittsburgh, Washington, DC, Baltimore and Philadelphia.

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# Systems Professionals

Our client, a Louisville based division of a Fortune 500 company, provides a state-of-the-art IBM 3090 environment for bright DP professionals. Requirements call for:

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- At least 1½ years experience with COBOL involving some systems analysis and design exposure
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Additional experience with MSA and/or McCormack & Dodge would be helpful.

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Temporary position (one year) in Atlanta office to advise and assist in planning of marketing strategies for technically complex product lines that require an extended selling cycle. Configure complex networking solutions for large computer data processing centers having computers manufactured by a variety of vendors. Consult with customers to identify and define needs or problems, conduct analysis and recommend solution using product technology or advise customer of alternate methods of solving need or problem. Manage sales activities of assigned district to promote sales of high performance data communication systems to large multi-mainframe accounts. Monitor, develop and control area sales activities, performance of representatives, marketing trends and competitive activities.

Must have 8 years' experience in offered position or 6 years' experience in management of sales of computer communications systems.

Experience in following areas is required.

● Knowledge of communications protocols and standards of computer data communications protocols and standards of computer data communications field to include: SNA, ISO, OSI, TCP/IP, IEEE, wide area and local area networking capabilities of products and host to host communications.

● Experience with IBM operation systems, specifically VM and MVS, and familiarity with IBM networking devices and products.

● Exposure to IBM channel extension products.

● Knowledge of techniques and products available in the marketplace which are used for networking sophisticated product lines.

● Extensive marketing and management skills, and a successful track record in customer prospecting.

● Proven ability to communicate with executive level management of Fortune 500 companies.

● Proven ability to manage and direct a sales force in a networking marketplace.

● Requires 40% travel within district.

Job located in Atlanta; 40 hours per week, 8 to 5. $53,000 per year. Send resume to Mr. Michael Green, Regional Sales Manager, Network Systems Corporation, Suite 200, 501 Church Street N.E., Vienna, Virginia 22180.

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## DEPUTY DIRECTOR OF APPLICATIONS DEVELOPMENT

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NYC office of municipal labor relations currently seeking experienced Project Manager with strong ADABAS/NATURAL skills. Solid technical and supervisory experience required. Please reply:

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**You choose the newspapers.** Depending on who you're looking for, you can select the combination of eight newspapers that best suits your needs - **Computerworld, InfoWorld, Network World, Digital News, Federal Computer Week,** and **Computer Currents**/Northern California, Southern California, and Boston Editions.

**You choose the region.** If you wish to recruit within a specific area, you can advertise in the regional editions of the newspapers you choose - East, West, or Midwest. Of course, national buys of individual newspapers or various combinations are also available when you need to extend your reach.

**You don't pay for readers you don't want.** Gone are the days when you have to worry about paying for waste circulation. The Computer Careers Network puts you in touch with qualified computer professionals - and only those qualified computer professionals you need to reach.

To put the new Computer Careers Network to work for you - regionally or nationally - call the sales office nearest you. Or contact John Corrigan, Recruitment Advertising Director, at 617-879-0700. And if you hurry, you can still get in on the special low introductory offer.

### Sales Offices:

**BOSTON**: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (508) 879-0700; **NEW YORK**: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652, (201) 967-1350; **WASHINGTON:** 3022 Javier Road, Suite 210, Fairfax, VA 22031, (703) 573-4115; **CHICAGO**: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433; **LOS ANGELES**: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164; **SAN FRANCISCO**: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164.

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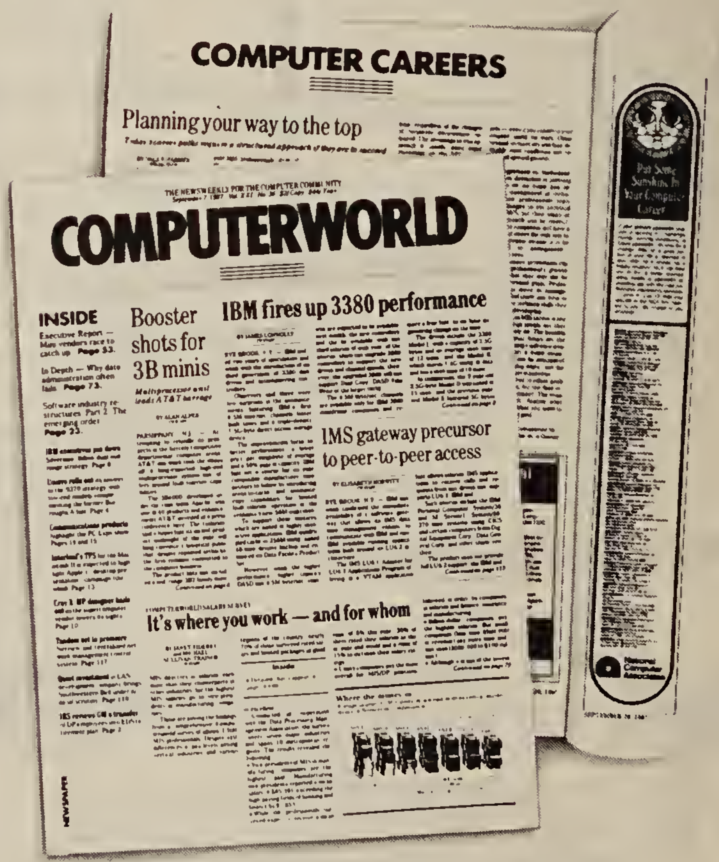
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## UNITED STATES GOVERNMENT

### THE CENSUS BUREAU IN CHARLOTTE, NC HAS IMMEDIATE OPENINGS FOR:

### DEC AUTOMATION SPECIALISTS

Responsibilities will include troubleshooting and training others in use of DEC Micro VAX II's. We need self-starters; people who can learn and teach others hardware and software applications.

These are once a decade opportunities involving work on a project of national importance. The positions are temporary - lasting through the Fall of 1990. Salaries range up to $33,200, and commensurate with experience.

The successful applicants will have good knowledge of, and experience working with, DEC/VAX Minicomputers. Experience with VAX/VMS Operating System and Digital Command Language (DCL) highly desirable. We need good communications skills, and a willingness to travel throughout the five state region around North Carolina.

***Qualified applicants should call or write immediately to:***

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# SOFTWARE DESIGN ENGINEERS

## PRINCIPAL/SECTION MANAGER

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General DataComm provides customers around the world with the most sophisticated, comprehensive selection of integrated data communications products available. In our Network Management Systems Directorate, we have openings for Principle Engineers and a Section Manager.

We are seeking individuals with a minimum of 5 years of related experience combined with a BS in computer science, computer engineering or electrical engineering. You will be involved in the development of state-of-the-art network management equipment utilizing your expertise in "C", UNIX™ and OSI. All positions require the ability to design from concept through implementation, test and release, along with good specification and documentation abilities.

We can offer you a highly competitive salary and a choice of health care programs including HMO, life insurance, 100% tuition reimbursement, profit sharing and stock purchase plan and other benefits.

☐ **Network Management**
☐ **OSI**
☐ **UNIX™/"C"**
☐ **Real-Time**
☐ **DataComm Protocols**

For further information please telephone Bill Mastrianna at (203) 758-1811 or write in confidence to: General DataComm, Inc., Technology Center, Middlebury, CT 06762-1299.

**General DataComm**

An Equal Opportunity Employer M/F/H/V

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## *PRESIDENT*

### ALABAMA SUPERCOMPUTER NETWORK AUTHORITY

The Alabama Supercomputer Network Authority, in conjunction with the Alabama Department of Finance, is charged with the establishment of a supercomputer center to provide services for the educational, research, and industrial needs of the State. The authority invites nominations and applications for the position of President. The supercomputer is physically located in Huntsville, Alabama, with statewide access through a high speed telecommunications network with major nodes located throughout the state. The President and his or her staff will provide the management and direction of the program and will report directly to the authority.

**Responsibilities of the President:**

1. To provide leadership and coordination for the facilities vendor.
2. To consult with the community of users and establish procedures necessary for fair and equitable access to the supercomputer.
3. To insure the quality and proficiency of the services provided by the facilities vendor.
4. To provide and execute a marketing plan which insures the best and maximum use of the supercomputer for the development of the State of Alabama.
5. To serve as the primary representative of the authority in liaison with the executive and legislative branches of state government.

**Qualifications:**

1. An earned master's degree, doctorate preferred.
2. A minimum of ten years of progressive experience in the overall management and/or coordination of high level computing services preferably with supercomputer involvement.
3. Substantial experience in an organized research environment with a high level of computer use.
4. Proven ability to organize and market services to diverse clientele.
5. Demonstrated competence in managing the fiscal affairs of large organizations providing computing services.

**Applications or nominations must be received by September 15, 1988.**

Salary is competitive and negotiable depending upon experience and qualifications. Applications or nominations and requests for information should be directed to:

**Dr George H. Emert**
**107 Samford Hall**
**Auburn University, AL 36849**

*The State of Alabama is an Equal Opportunity Employer*

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## S/38 CONSULTANTS

Software Alternatives, Inc. is the leading participant in IBM's marketing assistance program and is looking for a select number of Programmer/Analysts who can help us respond to our client's needs on the AS/400. If you have experience in the following:

- **Database Design**
- **RPG III**
- **Applications Design**
- **DDM**
- **COBOL**
- **System Tuning**
- **APPC**
- **Communications**

*Please forward a resume or call:*

**Software Alternatives, Inc.**
**5550-A Peachtree Pkwy.**
**Suite 520, Dept. CW 228**
**Norcross, GA 30092**

**(404) 242-6266**
***Barry Jones***

EOEM/F/V/H

---

## ADABAS ADS/O IDMS ORACLE

Excellent Benefits
Salary $30-45K
Southeast Locations

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NPS
NATIONAL PROGRAMMING SERVICES, INC.

121 Executive Center Drive □ Suite 126
Columbia, South Carolina 29210

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## DATA PROCESSING PROFESSIONALS

Computer Aid, Inc. (CAI) a professional consulting firm is actively recruiting experienced Programmer and System Analysts.

**As an employee of CAI you will have an opportunity to:**

* Gain valuable experience.
* Work on leading edge projects/technology.
* Work for one of the leading consulting firms in the nation.

**Desirable skills include:**

- DB2
- IDMS
- CICS
- IMS DB/DC
- SQL
- ADS/O
- MVS/XA
- ORACLE
- C
- VM/CMS
- DOS/VSE

*Interested applicants may write or call:*

**COMPUTER AID, INC.**
**Commerce Plaza III**
**Suite 315**
**5050 Tilghman St.**
**Allentown, PA 18104**
**(215) 395-5120**

---

## UPSTATE NEW YORK

### CONSULTANTS

Rochester, New York client assignments as follows:

- Sr. Analyst to evaluate and select S/W for key financials. BA/MBA Finance.
- Sr. P/A install McDonald Douglas S/W on IBM mainframe with IMS DB and COBOL.
- Sr. P/A install Data Fox S/W on IBM mainframe using Model 204

Long term positions with communications client consolidating divisions and establishing profit center controls. Resumes to Mike Gerber, Corporate Recruiter, Dept. CW.

**J. T. S.**
**COMPUTER SERVICES, INC.**
**412 Linden Ave**
**Rochester, NY 14625**
**716-586-1340**

*Contract Programming and Consulting Services*

---

## REGIONAL SALES REPRESENTATIVE

### IBM EQUIPMENT

Centron DPL Company, a leading sales and leasing company for IBM equipment is seeking a motivated professional for the position of Regional Sales Representative. This position provides sales support to create and maintain strong positive customer relations in the Northeast Regional Office. Applicants should be graduates in Marketing/Business Administration; or have large account sales expertise, particularly in the areas of IBM equipment, large mainframe and peripherals. Competitive salary and benefits. Send resumes to:

**Centron DPL Company**
**Personnel**
**7275 Flying Cloud Drive**
**Eden Prairie, MN 55344**

---

## TEXAS

**SR. SYS ANALYST............. $46,000**
Large utility co seeks individual to lead projects, perform feasibility studies, make presentations to mgmt and do analysis and design. Excellent relocation pkg.

**PROG ANALYST.. $40,000**
Large corp seeks individual to be involved in design & development, OS, COBOL, CICS. IMS, DB2 Human Resource Systems or Investment Systems a plus.

**PROG/ANALYST . $42,000**
Large mfg co seeks P/A with 5+ yrs exp. OS/MVS-XA, COBOL, JES2, JCL, and 2 yrs exp with MRP, Master Scheduling, Shop Floor Control & Capacity Planning.

**VAX SYSTEMS.... $46,000**
Large medical mfgr seeks Systems Programmers with 5+ yrs exp. VAX/VMS, Fortran environment. Exp with ASK or ORACLE software required.

**ROBERT HALF**
**DATA PROCESSING**
**1360 Post Oak Blvd.**
**#1470**
**Houston, Texas 77056**
**1-800-356-1994**

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PROGRAMMER, PENSION ADMINISTRATION to utilize computer and pension administration knowledge to design and write utility software programs and be familiar with FDP system. Create new systems to automate operations and prepare annual administration pension plans. Create and update master files and prepare annual reports, valuation, financial statements, employee certificates, IRS Return reports and pension benefit guarantee using LOTUS 123 and DBASE, and Pascal languages, the vehicle for programs. Train personnel in the usage systems. Two years of college with an Associate of Arts degree with a major in Computer Science required. One year experience required. $450.00 per 40-hour work week. Submit RESUME ONLY to JOB SERVICE OF FLORIDA, 701 S.W. 27th Avenue, Room 15, Miami, FL 33135. Ref.: Job Order # FL 5833196. Equal Opportunity Employer.

---

## FLORIDA CONNECTION

| | |
|---|---|
| P/A's Cobol CICS/IMS | To 40K |
| S/A's CABS | To 45K |
| P/A UNIX C DB | To 38K |
| P/A's MVS PL1 CICS | To 35K |
| P/A VAX Cobol FMS | To 30K |

Call Russ Bray, CPC

| | |
|---|---|
| SE's ATE ATLAS | To 48K |
| Sys Prog CICS | To 38K |
| P/A's S-38 RPG3 | To 38K |
| PA VAX C DB | To 36K |
| P/A Series 1 EDL | To 38K |

Call Leslie Miksch

**AVAILABILITY, INC.**
**813/286-8800**
**Dept. C, P.O. Box 25434**
**Tampa, Florida 33622**

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## MAJOR METROPOLITAN CAREER CHALLENGES

### Unsurpassed Personal/Family Quality of Life

In the Capital District of New York State (3 hours north of New York City and west of Boston) there exists a Renowned Manufacturer of Outdoor Power Equipment (Troy-Bilt Rototillers, for example) in an environment that provides enough culture, educational opportunity, and recreation to satisfy those fortunate enough to visit and/or reside here.

Our Information Systems Department while managing the data and systems needs of our operating departments is expanding and preparing for tomorrow, and is currently seeking the following professionals:

### Manager of Data Base Administration

* A professional who possesses at least 8 years of progressive large customer "relational" data base management experience plus a minimum of a Bachelor's of Science degree in Computer Science.

### Manager of Information Systems Planning

* A professional with at least 8 years of experience in systems applications, design, development, as well as hard and software selection and implementation. B.S. in Computer Science and demonstrated management expertise required.

Call me today or forward your credentials as soon as possible. We want to share with you all details of these positions, our diversified Compensation/Benefits package, and our pleasant environs!

**John Adams**
**Human Resources**
**Garden Way, Inc.**
**102nd St. & 9th Avenue**
**Troy, NY 12180**
**(518) 233-4764**

*An Affirmative Action/EEO Employer*
*M/F/H*

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SOFTWARE SYSTEMS SUPPORT SPECIALIST: Responsible for all aspects of performance analysis & technical support of all assigned software program products in Latin America. Insure maximum performance & support of all company software program products, including review, performance analysis of functional design phases of new & existing systems, recommendation of modifications/solutions of product issues, development & preparation of functional specifications of program systems. Develops & enhances program products within varied environment and/or varied applications. Responsible for introducing and developing the marketing of program product lines in the region. Provide technical support & training to marketing & technical staff, distributors & customers in the region. Responsible for early reporting, on-going performance monitoring & improvement programs, escalation between 33 countries. 8:00 am - 5:00 pm. 40 hrs/wk. Mon - Fri. $42,000/yr. Requirements: BS in Computer Science or Mechanical Engineering or foreign equivalency & 8 yr. experience in the job or 8 yr. management position experience in Systems Support, Data Processing. Proficiency in software applications. Knowledge & hands-on experience with program products development. Marketing experience & participation in the design & development of software program products in Latin America. 50% travel requirement. Bilingual/Spanish-English. Experience in providing training & technical support of software products. Resume to: Job Service of Fla., 105 E. Broward Blvd., Ft. Lauderdale, Fla. 33301. Attn: Job Order # FL-5790783.

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## Director of Computer and Learning Services

### *Ohio University*

Ohio University invites applications and nominations for the position of Director of Computing and Learning Services. The director is responsible for the areas of academic and administrative computing, voice/data communication systems and the learning resource center. Computing and Learning Services has a staff of 83 FTE and an annual budget of $5.6 million. The computing network of Ohio University consists of multiple IBM mainframe computers and several smaller systems. An IBM 4341 and two IBM 4381's are used to support academic and administrative processing. Campus data communication needs are supported by an extended fiber optic Ethernet connecting more than fifty processors. In addition, the over 7,000-line university-owned telephone system represents part of the multimillion dollar integrated communications network. The computer center will be moved to a completely renovated facility in 1991.

**Qualifications:** A successful candidate should have a minimum of five years' experience managing large computer facilities, broad knowledge of academic and administrative computing, telephone and communications operations, and learning resources. Excellent management and communication skills are critical. Candidates should possess a minimum of a master's degree or equivalent. The salary range will be in the mid 60's depending on experience and qualifications.

**Institution:** Ohio University was founded in 1804, making it the first institution of higher learning in the Old Northwest Territory. Located in Athens in the rolling hills of southeast Ohio, Ohio University offers a classic residential campus setting. More than 16,000 students are enrolled in undergraduate, graduate and medical programs at the Athens campus. In addition, the university maintains five regional campuses which enroll another 6,500 students.

**Application:** Interested candidates should submit a letter of application and resume showing experience, education and references. Names and telephone numbers of at least four references should be included. Application closing will be September 19, 1988. All applications and inquiries should be referred to:

**Dr. Gary Moden**
**Chair, Search Committee**
**212 Haning Hall**
**Ohio University**
**Athens, Ohio 45701**

*Ohio University is an Equal Opportunity, Affirmative Action Institution.*

## EAST COAST OPPORTUNITIES.

Understanding your needs, your technology, and your best long-term interests has been a Quest tradition since 1968. Contact us at any Quest city for an up to the minute review of quality opportunities involving DB2, CICS, IDMS, IMS, Networks, UNIX, C, or special security clearances.

Please call or send your résumé to.

**ATLANTA**
QUEST SYSTEMS, INC.
11 Corporate Square, Dept 120
Atlanta, GA 30329 (404) 636-3000

**WASHINGTON/MD/N. VA**
QUEST SYSTEMS, INC.
6400 Goldsboro Road, Dept. 510
Bethesda, MD 20817 (301) 229-4200

All fees paid by client companies.

**BALTIMORE**
QUEST SYSTEMS, INC.
11350 McCormick Road, Dept 300
Hunt Valley, MD 21031 (301) 771-6600

**CHERRY HILL, NJ**
QUEST SYSTEMS, INC
210 Lake Drive East, Dept 216
Cherry Hill, NJ 08002 (609) 482-8800

**PHILADELPHIA**
QUEST SYSTEMS, INC.
1150 1st Avenue, Dept. 412
King of Prussia, PA 19406 (215) 265-8100

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**Computer/Communications Industry Placement Specialists Since 1968.**

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## PROGRAMMER/ANALYSTS & SYSTEMS PROGRAMMERS

### FOR CAROLINAS AND SOUTHEAST

We have opportunities for on-line and database programmers and systems programmers for both in-house and consulting positions. Fee Paid. Please call or send resume to:

**Keith Reichle, CPC**
**Systems Search, Inc.**
**203 Heritage Park**
**Lake Wylie, S.C. 29710**
**803/831-2129**

(local to Charlotte, NC)

---

## PL1 IMS
### UPSTATE NEW YORK

Opportunities with Western New York's premier contract programming and consulting services firm serving major clients in Rochester and Syracuse.

Earning potential to $50K plus. Salary and benefits or subcontract position available.

Positions require two or more yrs. paid experience.

*Call Mike Gerber,*
*Corporate Recruiter*
*or send resume:*

**Dept. C W**
**J. T. S.**
**COMPUTER SERVICES, INC.**
**412 Linden Ave.**
**Rochester, NY 14625**
**716-586-1340**

*Not an Employment Agency*

---

## PROGRAMMERS/ANALYSTS
### HOLLYWOOD, FLORIDA

Compucare, a leader in health care information systems, has immediate openings for Programmers/Analysts in the Hollywood area. Qualified candidates will have 3-5 years experience writing DOS/VS COBOL and DOS/VSE JCL, 2-3 years CICS/VS COBOL Command level and DOS/VS VSAM. B.S. in related area, health care background preferred but not required. Compucare offers a highly competitive compensation and benefits package to the right candidates. Interested applicants should forward their resume, plus salary history to Robert Gutholc, Project Director:

**THE COMPUCARE COMPANY**
**C/O Memorial Hospital**
**3501 Johnson Street**
**Hollywood, Florida 33021**
**(305) 962-5307**

---

## THEY'RE HERE

Companies that need your expertise in Dec/Vax: Datatrieve, Decnet, Ethernet, DBMS-32, FMS, TDMS, RdB, VMS, Oracle, Ingress, Rally, DCL, All-in-One, Ask Manman. IBM Mainframe & Sys 3X: ADS/O, Adabas/Natural, CICS, Mics, Datacom, DBII, Focus, IDMS, IMS DL1, Unix, PL1, Mapics, Copies, MRPII. They're here in the Southeast and we can help you reach them. **Call or write, Vicki Hayes, CPC or Heather Bittinger, 711 Executive Place, Suite 302, Fayetteville, N.C. 28305. 919-323-3987**

PC *Professional Careers*

---

Advertising in Computerworld's recruitment pages will expand your pool of computer-professionals by 612,000.

**To place your ads**
**Call toll-free**
**800-343-6474**
**In Massachusetts**
**(617) 879-0700**
**Or send copy to:**

Computerworld
**375 Cochituate Road**
**Box 9171**
**Framingham, MA**
**01701-9171**

---

## RESEARCH TRIANGLE OPPORTUNITIES

**Currently recruiting experienced computer pros with background in any of the following: IBM Cobol mainframe applications; CICS; IDMS; IMS; ADABAS; ORACLE; DB 2; FOCUS; ADR DATACOM; SAS; VM/CMS; S/38 RPGIII or COBOL; DEC/VAX COBOL or FORTRAN; HP3000; Series 1; Financial; Mfg.; Banking; Insurance; MSA; Point of Sale; MVS, VM, NCP/VTAM or CICS Systems Progrs; DEC/VAX Systems Mgrs; Database Analysts; Method 1 or similar methodology. Partial listing of local, regional & nat'l fee paid positions. Call or write:**

**The Underwood Group, Inc.**
**3924 Browning Pl., Suite 7**
**Raleigh, NC 27609**
**(919) 782-3024**

---

## CONTRACTORS
### *IMMEDIATE OPENINGS*

- **S/38**
- **DB2**
- **ADABAS NATURAL**

***call***
***or send resume to:***

**DP RESOURCES, INC.**
**PO Box 5057**
**Burlington, NC**
**27216-5057**
**(919) 222-8063**

---

## IDMS ADS/O

We have several clients seeking experienced IDMS and ADS/O Programmers, Programmer Analysts and Systems Analysts. We have permanent and contract positions available in Georgia, the Carolinas, and Virginia with salaries from $25K - $45K. All fees/relocation paid. Send resume to JIM BOSTIC, PHILLIPS RESOURCE GROUP, P.O. BOX 5664, GREENVILLE, SC 29606.

**803/271-6350 (Day)**
**803/292-1181 (Evenings)**

---

## SOFTWARE SALES/ ACCOUNT EXECUTIVE

Boole and Babbage, Inc., a worldwide distributor of systems software products, has sales openings in Chicago and New Jersey. If you have a minimum of two years sales experience dealing with MVS sites, and a successful track record, you can expect a highly competitive salary with an extremely aggressive compensation plan. To be considered for the Sales Position, contact Sharon Crafton at 1-800-877-2289. If unable to call, send resume, in complete confidence to: Boole & Babbage, Inc., 5005 LBJ Freeway, Suite 850, Dallas, Texas 75244.

*An equal opportunity employer.*

---

## IMS DB/DC

**Permanent**
**and Consulting Positions**
**in Pittsburgh**
**and Washington, D. C.**

For rapidly expanding software company If you are looking for security and the BEST compensation in the industry GUARANTEED and have at least 2 years current IMS DB/DC, you can't afford not to contact us! Call Pittsburgh (412) 935-4430 or Washington, D C (703) 591-4228 and send resume to V P., 10195 Main Street, Fairfax, VA 22031

---

# It's easy to place your recruitment ad in Computerworld!

All the information you need is right here. Just call Lisa McGrath at 800-343-6474 (in MA, 617-879-0700). Or, if you want, you can send us the form below via mail or to our FAX machine. You can reach our FAX at ext. 739 or 740 at either of the above numbers.

The following information will help you determine the size ad you'd like to run and when you'd like to run it.

**CLOSING DATES:** To reserve space, you need to call us by 5PM (all continental U.S. time zones), 7 days prior to the Monday issue date. We need your ad materials (camera-ready mechanical or copy for pub-set ad) by 5PM, 6 days prior to the weekly issue.

**AD COPY:** We'll typeset your ad at no extra charge. You can give us copy via phone, U.S. mail, or FAX. To typeset an ad for you, we need clean, typewritten copy. Figure about 30 words to the column inch, not including headlines. (There are seven columns on each page.)

**LOGOS AND SPECIAL ARTWORK:** Any logos or special artwork should be enclosed with your ad copy. For best reproduction, please send us either a stat of your logo or a clean sample on white bond paper.

**COLUMN WIDTHS AND MINIMUM DEPTHS:** Your ad can be one of seven different widths. There is a minimum depth requirement for each width. You can also run larger ads in half-inch increments. The chart below can serve as a reference.

| NUMBER OF COLUMNS | WIDTH | MINIMUM DEPTH |
|---|---|---|
| 1 column | 1-1/4″ | 2″ |
| 2 columns | 2-5/8″ | 2″ |
| 3 columns | 4-1/16″ | 3″ |
| 4 columns | 5-9/16″ | 4″ |
| 5 columns | 6-15/16″ | 5″ |
| 6 columns | 8-3/8″ | 6″ |
| 7 columns | 9-3/4″ | 7″ |

**RATES:** Your rate will depend on the size of your ad and whether you choose to run regionally or nationally. The national rate is $12.60 per line or $176.40 per column inch. The regional rate (Eastern, Midwestern or Western editions) is $8.00 per line or $112 per column inch. You can run your ad in any two regions for $10.60 per line or $148.40 per column inch. In all cases, you can earn volume discounts.

The minimum ad size is two column inches (1-1/4″ wide by 2″ deep) and costs $352.80 if run nationally. A sample of this size appears below. You can run larger ads in half-inch increments at $88.20 per half inch. Box numbers are available and cost $25 per insertion ($50 if foreign).

**Programmer Analyst**

This is a sample ad for Computerworld's Computer Careers section. It will help you decide what size ad you'd like to run. Remember that you can run your ad either regionally or nationally in our recruitment section and that the minimum ad size is one column (1-4/16 inches wide) by two inches deep (like this sample). This ad would cost $352.80 in our national edition, $224.00 in the Eastern, Midwestern, or Western Edition, and $296.80 in two regions; volume discounts apply.

**SAMPLE AD SIZES AND PRICES:** To assist you in planning your recruitment advertising, the following shows common ad sizes and their respective costs.

| | *One Region (East, Midwest or West)* | *Two Regions (East/West East/Midwest, Midwest/West)* | *National Edition* |
|---|---|---|---|
| 1 column x 2″ | $ 224.00 | $ 296.80 | $ 352.80 |
| 2 columns x 2″ | $ 448.00 | $ 593.60 | $ 705.60 |
| 3 columns x 3″ | $1,008.00 | $1,335.60 | $1,587.60 |
| 4 columns x 5″ | $2,240.00 | $2,968.00 | $3,528.00 |
| 5 columns x 7″ | $3,920.00 | $5,194.00 | $6,174.00 |

**PAYMENT:** If you're a first-time advertiser or if you haven't established an account with us, we need your payment in advance (or with your ad) or a purchase order number. Once you have established an account with us, we'll bill you for any ads you run as long as your payment record is good.

**COMPUTER CAREERS NETWORK BUYS:** You can take advantage of special rates that let you run your ad in *Computerworld* and *Computerworld*'s sister newspapers at special rates. Choose from *Network World, InfoWorld, Digital News, Federal Computer Week,* and *Computer Currents.* Call for details.

---

## Computerworld Recruitment Advertising Order Form

Ad Size:______ columns wide by ______ inches deep

Issue Date(s): ______________________________

Name: ______________________________

Company: ______________________________

Address: ______________________________

Telephone: ______________________________

**Region:** ☐ East ☐ Midwest ☐ West **National:** ☐
☐ East/Midwest ☐ Midwest/West ☐ East/West

Send this form to: **COMPUTERWORLD RECRUITMENT ADVERTISING**
375 Cochituate Road, Box 9171, Framingham, MA 01701-9171
800-343-6474 (In MA, 617-879-0700)
Telecopier Extensions: 739 or 740

## DATA PROCESSING PROFESSIONALS

## *We speak your language!*

Yes, there are recruitment people who know the workings of the computer field, who concentrate on understanding your needs…and filling them.

Through our national network, these specialists can scour the country to find the one best candidate for your company's opening. If you hire at the middle management or executive level in the computer field, get to know us better.

Independently owned and operated offices in major cities. For the office specializing in your area, call toll free: (800) 221-4864. (in NY State, call 212-697-4314.)

**Fortune**
*Personnel Consultants*

---

## SYSTEMS ANALYST

### $35,632 - 43,973

***Management Systems Design and Implementation at Long Beach City College***

The administrative Data Processing Department is responsible for the Fiscal and management needs of this $50MM Annual Budget College. We process the Payroll and Business records as well as maintain detailed records on student attendance and grades. We use Hewlett Packard 3000 computers with models 48, 58, and 70 installed. A model 950 is planned for first quarter 1989 to replace the 48 and 70. We support over 200 on-line workstations at two major campuses. A new baseband LAN will be installed concurrently with the model 950. We recently installed the CASE tool "Excelerator" by Index Technology. Our users access the databases from their terminals using the HP products INFORM and REPORT as well as specialized programs written in Data Processing.

We need a Systems Analyst with great people skills to work with our user community in developing systems and in-depth technical knowledge to work with our programming staff.

FOR APPLICATION AND INFORMATION CONTACT:

PERSONNEL SERVICES OFFICE
**LONG BEACH CITY COLLEGE**
4901 E. CARSON STREET
LONG BEACH, CA 90808
(213) 420-4391

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GCOS SYSTEMS w/GMAP
IDMS BATCH
TECH WRITERS w/HEALTH CARE
INT. BANKING w/YOURDON
IMS TELEPHONE BILLING
GENESYS PAYROLL
DB2/SQL
IMS DS/DC
PL1/IMS
IMS/DBA
IDMS ADS/O
CICS/PL1
DATACOM/IDEAL
ISA S/W
FOCUS

The Experts
**NATIONAL PROJECT CENTER**
4401 W. Tradewinds Ave. #302
Lauderdale by the Sea, FL 33308

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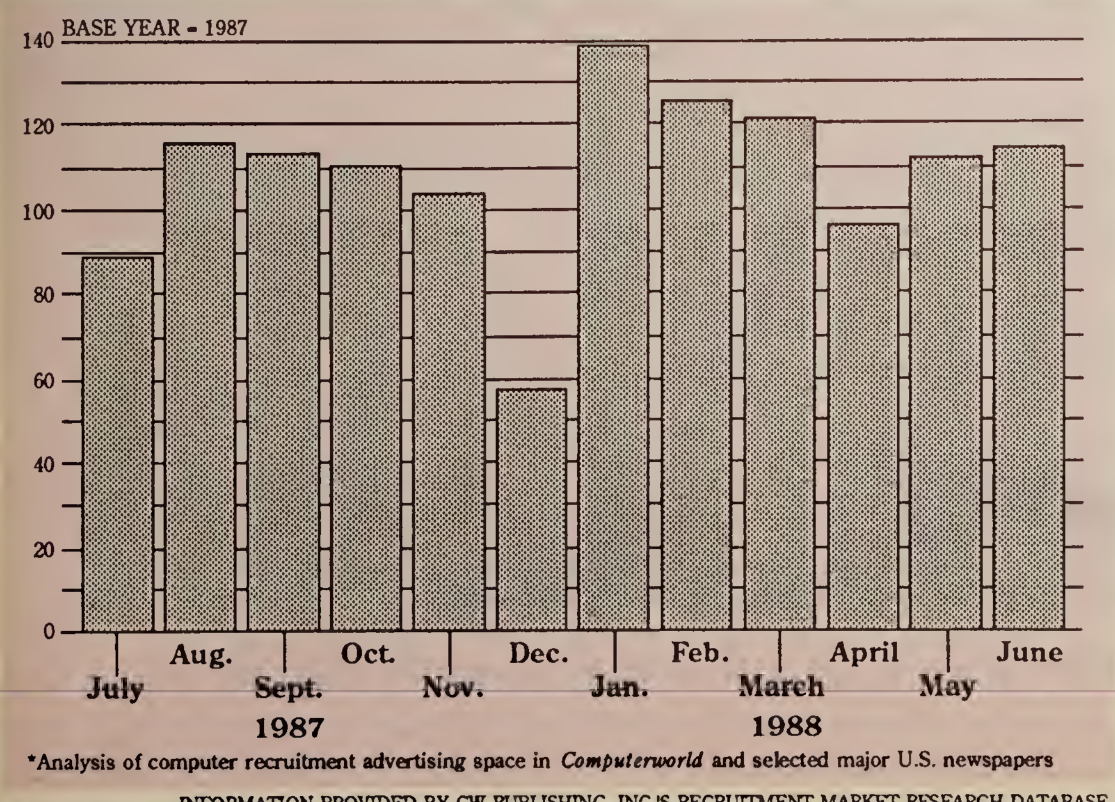
# CAREER INDEX

## Computer recruitment advertising index*



*Analysis of computer recruitment advertising space in *Computerworld* and selected major U.S. newspapers

INFORMATION PROVIDED BY CW PUBLISHING, INC.'S RECRUITMENT MARKET RESEARCH DATABASE

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Our Quality shines through

## Computer Professionals

REYNOLDS ALUMINUM has multiple openings for computer professionals at its Richmond, Virginia, Corporate Headquarters. The environment consists of an IBM 3090 - 400 system utilizing MVS / XA, JES2, ACF / VTAM, TSO / ISPF, CICS (MRO), DB2, DISOSS, IMS / DB, and S / 38's and S / 36's utilizing RPG III, APPC, and various utilities. Successful applicants will possess a college degree or compensating experience, and enjoy working with a team of highly skilled and motivated professionals in an atmosphere of challenge and growth provided by a Fortune 125 company. Richmond offers excellent educational, cultural and recreational opportunities.

### MVS LEAD SYSTEMS PROGRAMMER

Minimum four years MVS systems programming experience with expertise in the following areas: MVS/XA-JES2 internals and project leadership, TSO support, SMP/E, Program Product installation, and Assembly language programming. Experience in VM, Tuning, or disk space management is a plus.

### SYSTEM / 38 ANALYST

Two - three years experience in RPG III analysis and design. Must know SDA, SEU, Query. Experience in APPC and other utilities helpful. Will support manufacturing and technical applications. Opportunity to work with newly installed AS / 400.

Competitive salary commensurate with experience, including outstanding fringe benefits package and strong educational program. Please send resume outlining work and salary history, in confidence, to: P.A. Bowman, Personnel Manager, Information Systems, REYNOLDS METALS COMPANY, P.O. Box 27003, Richmond, VA 23261. Equal Opportunity Employer

**REYNOLDS METALS COMPANY**

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## 1000 DP Opportunities

| | |
|---|---|
| System 38 Prog/Anal's (RPG III) | 27-33K |
| MAPICS Prog/Anal's (S/36 or S/38) | 30-45K |
| ORACLE SQL Prog/Anal's | 29-39K |
| DB2 - SQL Prog/Anal's | 30-40K |
| UNIVAC 1100 Prog/Anal's | 28-33K |
| FOCUS Prog/Anal's | 28-35K |
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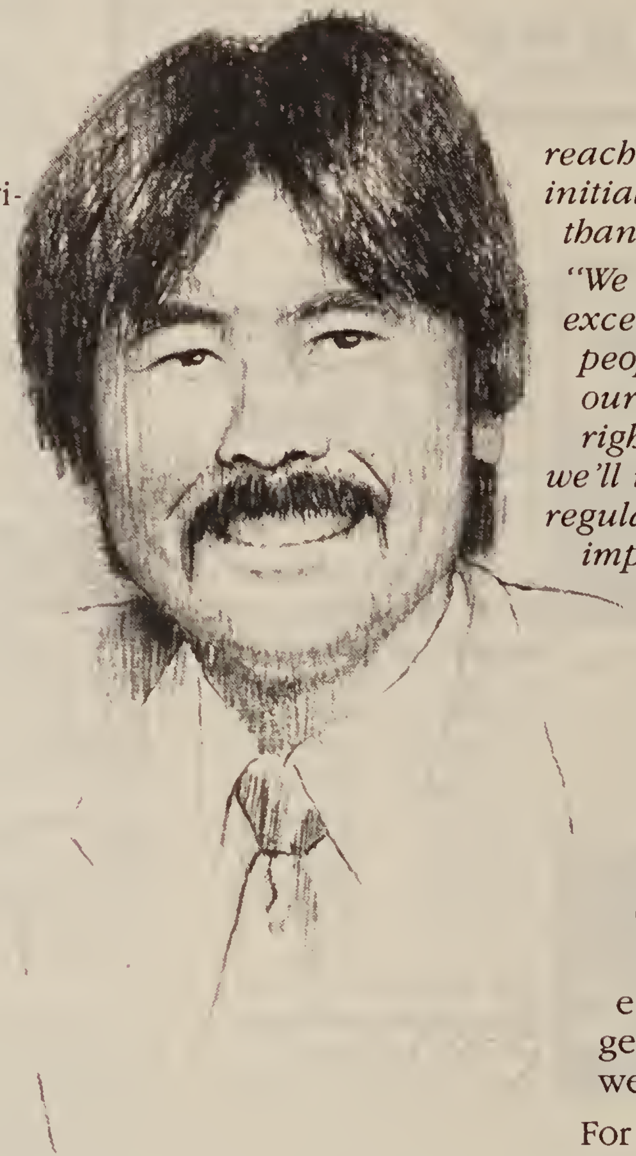

Cesar Namba is Assistant Vice President for MIS Recruitment at Imperial Corporation of America (ICA) in San Diego, California. ICA is a financial services organization that has savings and mortgage institutions in 20 states.

For Cesar, filling important MIS/DP positions is the name of the game. Recently, ICA embarked upon a change in part of its corporate technology, and that meant that Cesar had to go to work finding qualified personnel. And for reaching the best possible candidates, he turned to *Computerworld.*

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# Used equipment: Caveat emptor

*Protecting yourself in areas of maintenance, reliability especially crucial*

BY DAVID GABEL
SPECIAL TO CW

Roy C. Davis, executive director of the National Association of Computer Dealers (NACD), knows about the hazards of buying used computer peripherals. Take one of his line printers — please. "I could probably sell it for top dollar," Davis says, "but I know it will fail after 30 minutes."

Reliability is a major concern in purchasing used computer equipment, and the question is particularly germane in the case of peripherals. If anything breaks in a system, chances are it will be a peripheral that includes relays, drive motors, switches and other electromechanical components as well as solid-state innards.

It is not likely, however, that the person responsible for buying computer equipment can tell if a printer, disk drive or other electromechanical peripheral will operate properly, even for half an hour. Unlike a used car, there are few obvious indicators that the equipment is in good condition or ready for the junkyard.

Fortunately, making a safe purchase is a relatively simple matter. "It largely depends on the dealer and the agreement for purchase," says Lee Kroon, editor in chief at Computer Economics, Inc. in Carlsbad, Calif., publisher of a series of newsletters on the economics of running a data center. "You have to get a reputable dealer who belongs to an association with ethical standards," Kroon says.

### Let's make a deal

One of the largest such associations is the Computer Dealers and Lessors Association (CDLA) based in Washington, D.C., whose members account for about 80% of the market for used and leased equipment, according to Ned Livornese, the group's assistant executive director. "We have a code of ethics in the CDLA that our members must adhere to," he says. "There are other similar organizations as well."

The other organizations include the American Society of Computer Dealers, also located in Washington, D.C., and the Digital Dealers Association (DDA), based in Chelsea, Mich.

The CDLA's Code of Professional Conduct and Practices does not delve into standards of reliability. It does call on members to "follow through and complete any agreement made verbally or otherwise to any CDLA member, prospect or client" and to honor agreements as expeditiously as possible.

Doing business with a trade association member, therefore, may be only one step toward assuring that used equipment is reliable. Buyers must see to it that the purchase agreement that a dealer is committed to uphold contains necessary safeguards concerning reliability and maintainability.

Buyers of used IBM equipment can get help here from the 1956 consent decree that opened up the computer market to competition, including competition from dealers of used equipment. Provisions of the decree require IBM to provide certificates of maintainability on equipment that IBM has maintained. The certificate, known as a Maintenance Acceptability Qualification (MAQ) letter, is to be available for issue with the equipment when it is sold.

Other computer makers, such as Digital Equipment Corp., Unisys Corp. and AT&T, use similar instruments to ensure the buyer that the equipment will be kept running under a qualified maintenance plan.

In the event that equipment has not been maintained by its vendor, the vendor may charge a new owner to inspect the equipment — and perhaps do repairs — before he will issue an MAQ or equivalent certificate. Charges for the the inspection and any necessary repairs must be figured into the cost of a purchase.

### Coming to terms

There are alternatives to securing transfer of the manufacturer's maintenance, such as arranging for maintenance by another party, the CDLA's Livornese notes.

Either way, he says, the eligibility for maintenance should be spelled out in the purchase agreement. "You need a guarantee that the equipment will be accepted for maintenance by somebody. We strongly advocate that our members provide that. The buyer should ask for it in the contract."

As another alternative, a buyer might be willing to pay a lower price for equipment not covered by a maintenance certificate if he has his own in-house maintenance staff. The need for in-house maintenance, too, should be investigated in advance and taken into account in the purchase contract — before the buyer finds that the used equipment that was going to save him a lot of money does nothing but cost maintenance dollars.

An assurance of maintenance does not mean the equipment will run properly when it is turned on, but it does help ensure that the equipment will be fixed if it does not work.

The buyer should work out other potential glitches that he might hold the dealer directly accountable for, such as a failure of the equipment to work at all. Again, such warranty issues should be taken into account during negotiations. "Get that all worked out up front and in writing," the NACD's Davis says. "You need the opportunity to know it works."

Gabel is a free-lance writer and former data center manager based in Northport, N.Y.

## The BoCoEx Index

*Closing prices report for the week ending July 29, 1988*

| | Closing price | Recent high | Recent low |
|---|---|---|---|
| IBM PC Model 076 | $725 | $950 | $500 |
| XT Model 086 | $1,100 | $1,200 | $875 |
| XT Model 089 | $1,350 | $1,400 | $1,150 |
| AT Model 099 | $2,300 | $2,350 | $1,800 |
| AT Model 239 | $2,600 | $2,900 | $2,300 |
| AT Model 339 | $3,150 | $3,250 | $2,900 |
| PS/2 Model 30 | $1,525 | $1,650 | $1,300 |
| PS/2 Model 50 | $2,300 | $2,375 | $1,900 |
| Compaq Portable I | $800 | $875 | $700 |
| Portable II | $2,000 | $2,200 | $1,650 |
| Portable III | $3,000 | $3,200 | $2,825 |
| Portable 286 | $2,200 | $2,350 | $1,675 |
| Plus | $1,100 | $1,100 | $900 |
| Deskpro 20-MHz | $1,200 | $1,400 | $975 |
| Deskpro 286 | $2,500 | $2,500 | $2,000 |
| Deskpro 386 | $5,100 | $5,100 | $4,600 |
| Apple Macintosh 512 | $675 | $825 | $595 |
| 512E | $800 | $925 | $650 |
| Plus | $1,050 | $1,125 | $850 |
| Plus 20-MHz | $1,350 | $1,425 | $1,300 |
| SE | $1,900 | $2,000 | $1,700 |
| SE 20-MHz | $2,400 | $2,500 | $2,300 |
| II | $4,750 | $4,750 | $4,500 |
| NEC Multispeed EL | $900 | $950 | $650 |
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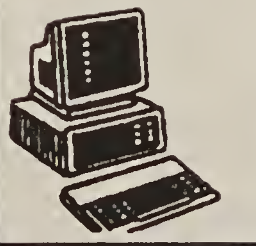

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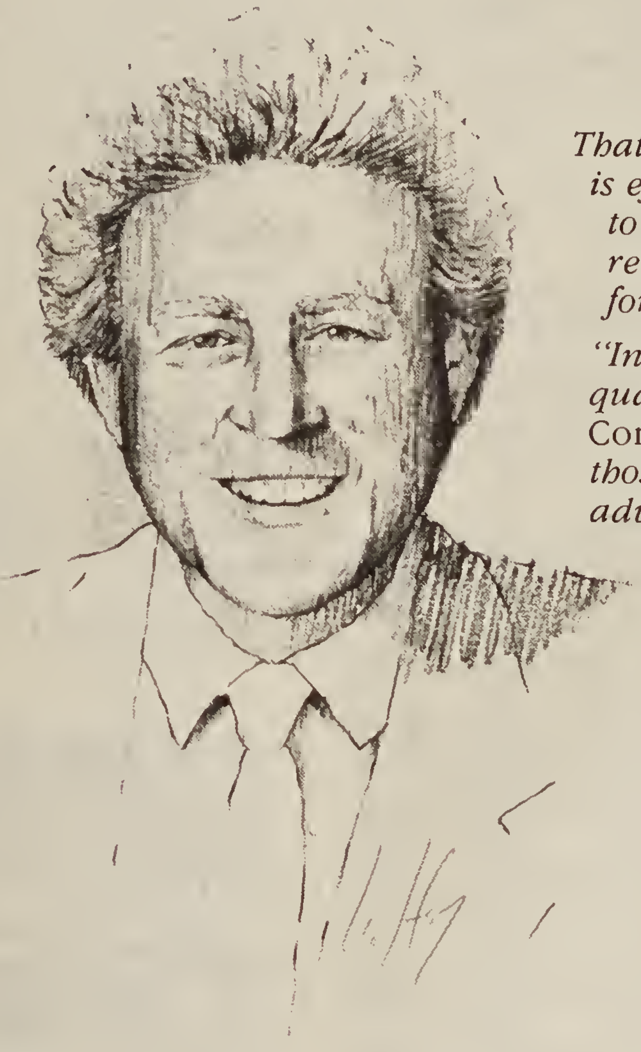

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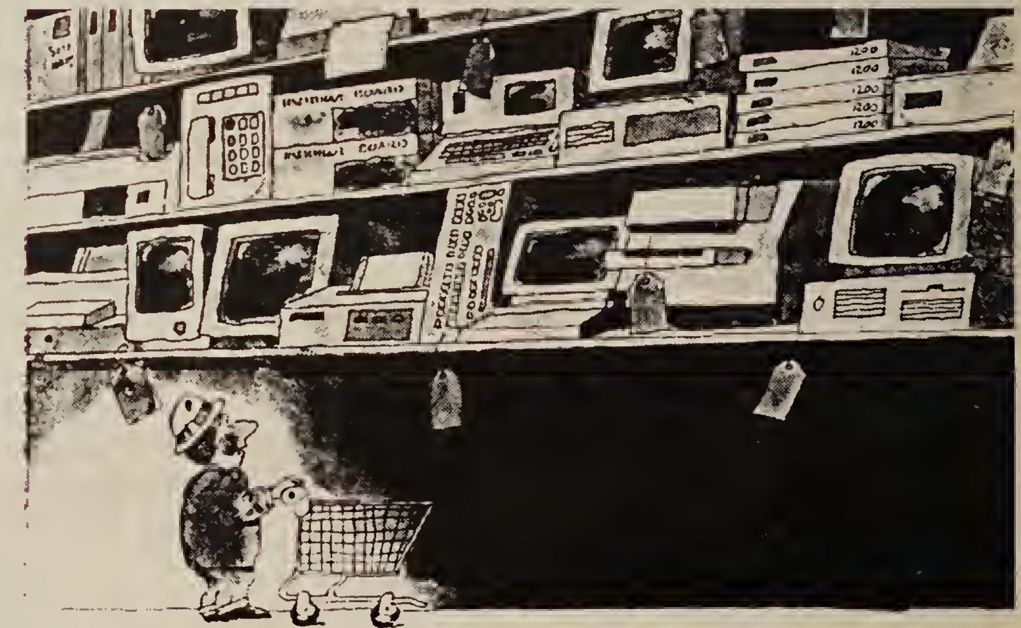

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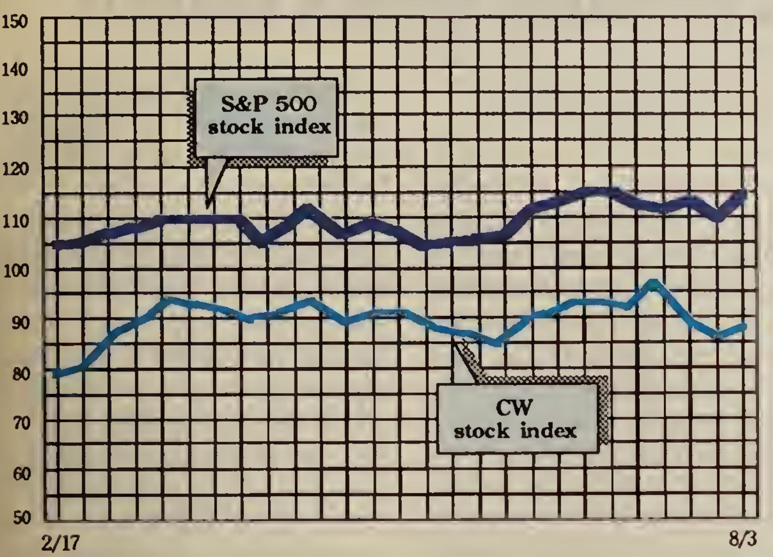

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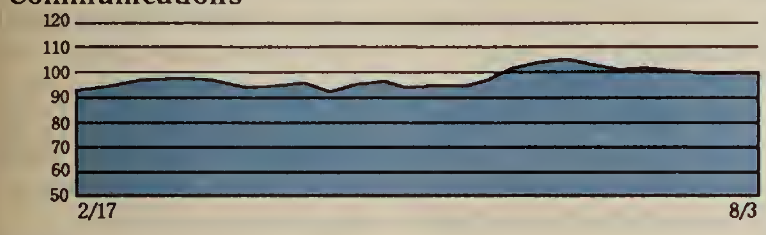
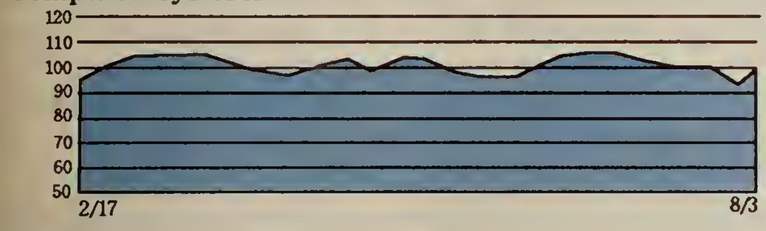
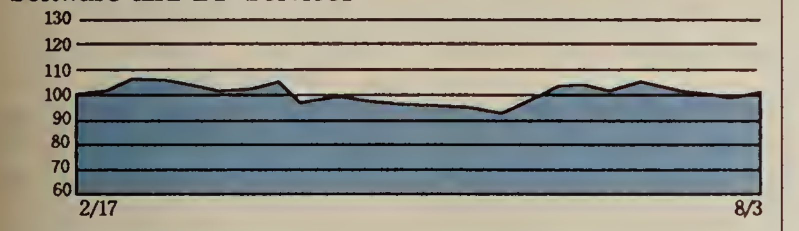
**Communications**



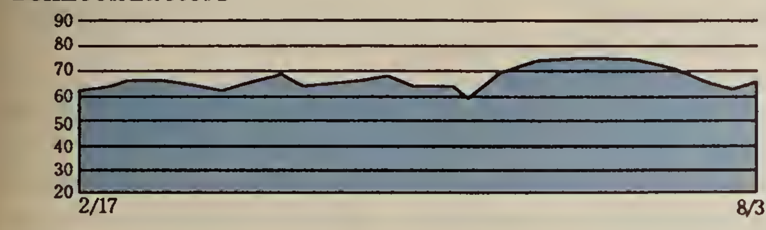
**Computer Systems**



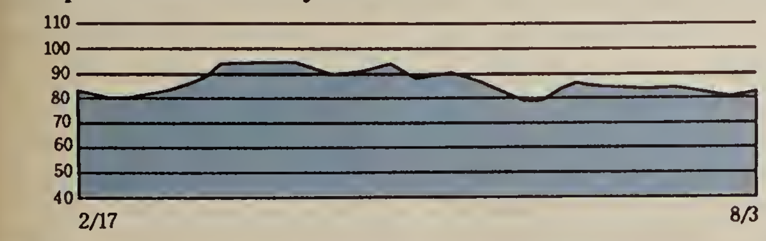
**Software and DP Services**



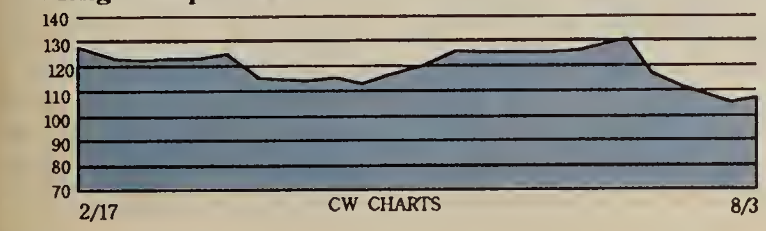
**Semiconductors**



**Peripherals and Subsystems**



**Leasing Companies**



CW CHARTS

# Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 3, 1988

## Communications and Network Services

| EXCH | | 52-WEEK RANGE (1) | | PRICE CLOSE AUG. 8 1988 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|---|
| N | AMERICAN INFO TECHS CORP | 100 | 74 | 92.00 | 3.6 | 4.1 |
| Q | ANDREW CORP | 19 | 11 | 17.50 | 0.0 | 0.0 |
| Q | ARTEL COMM CORP | 3 | 1 | 2.38 | 0.0 | 0.0 |
| N | AT&T | 36 | 20 | 26.38 | 0.3 | 1.0 |
| Q | AVANT GARDE COMP INC | 6 | 2 | 1.63 | -0.5 | -23.5 |
| Q | AVANTEK INC | 16 | 6 | 5.75 | -0.1 | -2.1 |
| N | AYDIN CORP | 35 | 16 | 19.88 | -0.5 | -2.5 |
| N | BELL ATLANTIC CORP | 80 | 61 | 71.50 | 3.3 | 4.8 |
| N | BELLSOUTH CORP | 44 | 29 | 42.13 | 1.5 | 3.7 |
| Q | COMPRESSION LABS INC | 6 | 2 | 3.50 | 0.0 | 0.0 |
| O | COMPUTER NETWORK TECH | 5 | 1 | 1.24 | 0.0 | -2.4 |
| O | CONTEL CORP | 40 | 25 | 35.75 | -0.3 | -0.7 |
| Q | DATA SWITCH CORP | 10 | 4 | 6.63 | -1.3 | -15.9 |
| Q | DIGITAL COMM ASSOC | 46 | 20 | 31.25 | -0.9 | -2.7 |
| Q | DYNATECH CORP | 32 | 14 | 21.75 | 0.3 | 1.2 |
| Q | FIBRONICS INTERNATIONAL INC | 6 | 2 | 3.44 | 0.2 | 5.8 |
| Q | GANDALF TECHNOLOGIES | 8 | 5 | 7.00 | -0.1 | -1.8 |
| Q | GENERAL DATACOMM INDS | 10 | 3 | 3.50 | 0.1 | 3.7 |
| N | GTE CORP | 45 | 29 | 40.63 | 1.6 | 4.2 |
| Q | INFOTRON SYS CORP | 14 | 5 | 11.00 | -0.5 | -4.3 |
| N | ITT CORP | 66 | 42 | 49.88 | 1.4 | 2.8 |
| N | M A COM INC | 16 | 7 | 10.63 | 0.1 | 1.2 |
| Q | MCI COMMUNICATIONS CORP | 18 | 7 | 16.50 | 0.4 | 2.3 |
| Q | MICOM SYS INC | 17 | 7 | 14.88 | 0.0 | 0.0 |
| Q | NETWORK EQUIPMENT TECH INC | 28 | 12 | 20.25 | 0.3 | 1.3 |
| Q | NETWORK SYS CORP | 13 | 7 | 9.75 | 0.0 | 0.0 |
| N | NORTHERN TELECOM LTD | 24 | 14 | 18.25 | 0.5 | 2.8 |
| Q | NOVELL INC | 30 | 12 | 26.50 | 2.8 | 11.6 |
| N | NYNEX CORP | 78 | 58 | 66.38 | 3.6 | 5.8 |
| N | PACIFIC TELESIS GROUP | 34 | 23 | 29.38 | 0.8 | 2.6 |
| N | PARADYNE CORP | 9 | 4 | 5.75 | -0.1 | -2.1 |
| A | PENRIL CORP | 5 | 1 | 4.38 | 0.0 | 0.0 |
| N | PLESSEY PLC | 38 | 23 | 28.75 | -0.2 | -0.6 |
| N | SCIENTIFIC ATLANTA INC | 20 | 8 | 14.50 | 0.5 | 3.6 |
| N | SOUTHWESTERN BELL CORP | 46 | 22 | 38.63 | 1.8 | 4.7 |
| Q | 3 COM CORP | 26 | 12 | 18.13 | 0.6 | 3.6 |
| Q | UNGERMANN BASS INC | 13 | 5 | 12.31 | 0.0 | 0.0 |
| N | U S WEST INC | 60 | 43 | 55.75 | 2.6 | 4.9 |

## Computer Systems

| EXCH | | 52-WEEK RANGE (1) | | PRICE CLOSE AUG. 8 1988 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|---|
| Q | ALLIANT COMPUTER SYS | 20 | 5 | 5.25 | 0.0 | 0.0 |
| Q | ALPHA MICROSYSTEMS | 8 | 3 | 6.75 | 0.3 | 3.8 |
| Q | ALTOS COMPUTER SYS | 15 | 9 | 9.75 | 0.3 | 2.6 |
| A | AMDAHL CORP | 56 | 19 | 47.13 | 1.1 | 2.4 |
| Q | APOLLO COMPUTER INC | 23 | 9 | 9.63 | 0.1 | 1.3 |
| Q | APPLE COMPUTER INC | 60 | 28 | 44.75 | 2.0 | 4.7 |
| N | BOLT BERANEK & NEWMAN | 25 | 12 | 16.50 | -0.4 | -2.2 |
| Q | BRITTON LEE INC | 4 | 1 | 2.69 | 0.2 | 7.5 |
| N | COMPAQ COMPUTER CORP | 79 | 34 | 58.63 | 0.4 | 0.6 |
| Q | COMPUTER AUTOMATION INC | 16 | 4 | 5.13 | 0.8 | 17.1 |
| A | COMPUTER CONSOLES INC | 9 | 2 | 8.75 | 0.1 | 1.4 |
| Q | CONCURRENT COMP CORP | 24 | 11 | 19.38 | 2.4 | 14.0 |
| N | CONTROL DATA CORP DEL | 38 | 18 | 23.50 | 1.3 | 5.6 |
| Q | CONVERGENT TECH | 9 | 3 | 3.75 | 0.1 | 3.4 |
| Q | CONVEX COMPUTER CORP | 17 | 6 | 8.00 | 1.1 | 16.4 |
| N | CRAY RESH INC | 119 | 47 | 81.88 | 3.6 | 4.6 |
| Q | DAISY SYS CORP | 12 | 5 | 9.38 | -0.1 | -1.3 |
| N | DATA GEN CORP | 37 | 16 | 18.38 | -0.8 | -3.9 |
| N | DATAPOINT CORP | 9 | 3 | 4.88 | 0.0 | 0.0 |
| N | DIGITAL EQUIP CORP | 200 | 99 | 103.50 | 1.3 | 1.2 |
| N | FLOATING POINT SYS INC | 11 | 3 | 3.25 | 0.3 | 8.3 |
| N | GOULD INC | 34 | 8 | 15.00 | 0.1 | 0.8 |
| N | HARRIS CORP | 41 | 22 | 27.63 | 0.6 | 2.3 |
| N | HEWLETT PACKARD CO | 74 | 36 | 50.25 | 1.9 | 3.9 |
| N | HONEYWELL INC | 91 | 49 | 65.88 | 2.4 | 3.7 |
| N | IBM | 176 | 102 | 125.75 | 4.6 | 3.8 |
| Q | INFORMATION INTL INC | 16 | 9 | 14.75 | -0.5 | -3.3 |
| Q | IPL SYS INC | 3 | 1 | 2.38 | -0.4 | -13.6 |
| Q | MASS COMPUTER CORP | 14 | 4 | 5.00 | 1.0 | 25.0 |
| N | MATSUSHITA ELEC INDL LTD | 230 | 103 | 223.50 | 6.8 | 3.1 |
| Q | MEGADATA CORP | 6 | 2 | 2.63 | -0.1 | -4.5 |
| Q | MENTOR GRAPHICS CORP | 39 | 14 | 31.50 | 2.5 | 8.6 |
| N | NBI INC | 12 | 4 | 4.00 | -0.1 | -3.0 |
| N | NCR CORP | 87 | 50 | 58.00 | 1.6 | 2.9 |
| N | PRIME COMPUTER INC | 31 | 12 | 14.50 | 0.4 | 2.7 |
| Q | PYRAMID TECHNOLOGY | 16 | 5 | 12.25 | -0.5 | -3.9 |
| Q | STRATUS COMPUTER | 35 | 15 | 24.63 | 0.9 | 3.7 |
| Q | SUN MICROSYSTEM INC | 44 | 14 | 39.25 | 3.3 | 9.0 |
| Q | SYMBOLICS INC | 5 | 1 | 1.06 | -0.1 | -10.5 |
| Q | SEQUENT COMPUTER SYS INC | 20 | 9 | 17.38 | 0.5 | 3.0 |
| N | TANDEM COMPUTERS INC | 37 | 14 | 15.00 | 0.9 | 6.2 |
| N | TANDY CORP | 57 | 28 | 43.63 | 0.8 | 1.7 |
| N | ULTIMATE CORP | 37 | 9 | 10.13 | -0.6 | -5.8 |
| N | UNISYS CORP | 48 | 24 | 35.25 | 2.0 | 6.0 |
| A | WANG LABS INC | 19 | 9 | 10.00 | 0.5 | 5.3 |

## Software & DP Services

| EXCH | | 52-WEEK RANGE (1) | | PRICE CLOSE AUG. 8 1988 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|---|
| Q | ADVANCED COMP TECH | 6 | 1 | 1.31 | 0.1 | 10.5 |
| N | AGS COMPUTERS INC | 30 | 11 | 26.75 | -0.1 | -0.5 |
| Q | AMERICAN MGMT SYS INC | 20 | 9 | 14.63 | 0.0 | 0.0 |
| Q | AMERICAN SOFTWARE INC | 19 | 6 | 14.50 | 2.0 | 16.0 |
| N | ANACOMP INC | 12 | 4 | 9.00 | 0.0 | 0.0 |
| Q | ANALYSTS INTL CORP | 10 | 4 | 8.75 | 0.0 | 0.0 |
| Q | ASHTON TATE | 33 | 13 | 23.25 | 0.0 | 0.0 |
| Q | ASK COMPUTER SYS INC | 16 | 6 | 14.25 | 1.5 | 11.8 |
| Q | AUTODESK INC | 34 | 12 | 26.50 | 1.1 | 4.4 |
| N | AUTO DATA PROCESSING | 55 | 16 | 38.50 | 0.6 | 1.7 |
| Q | BOOLE & BABBAGE INC | 12 | 5 | 9.13 | 0.1 | 1.4 |
| N | COMPUTER ASSOC INTL INC | 37 | 15 | 27.50 | 0.5 | 1.9 |
| Q | COMPUTER HORIZONS CORP | 14 | 7 | 11.25 | -0.3 | -2.2 |
| N | COMPUTER SCIENCES CORP | 73 | 38 | 47.88 | 4.3 | 9.7 |
| N | COMPUTER TASK GROUP INC | 16 | 9 | 12.38 | -0.8 | -5.7 |
| Q | COGNOS INC | 17 | 4 | 5.25 | -0.2 | -3.5 |
| Q | COMSHARE INC | 27 | 12 | 21.50 | -0.3 | -1.1 |
| N | CULLINET SOFTWARE INC | 14 | 4 | 6.63 | -0.1 | -1.9 |
| Q | DUQUESNE SYS INC | 22 | 10 | 17.75 | 0.3 | 1.4 |
| A | DATA ARCHITECTS INC | 16 | 7 | 13.75 | 0.0 | 0.0 |
| N | GENERAL MTRS (CLS E) | 51 | 30 | 40.00 | -0.8 | -1.8 |
| Q | HOGAN SYS INC | 14 | 3 | 4.00 | 0.0 | 0.0 |
| Q | INFORMIX CORP | 31 | 12 | 12.50 | -0.3 | -2.0 |
| Q | INTELLICORP INC | 8 | 2 | 2.63 | -0.1 | -4.5 |
| Q | KEANE INC | 16 | 6 | 14.25 | 0.6 | 4.6 |
| Q | LOTUS DEV CORP | 40 | 19 | 21.50 | 1.0 | 4.9 |
| Q | MANAGEMENT SCI AMER | 14 | 6 | 8.88 | -0.8 | -7.8 |
| Q | MICRO PRO INTL CORP | 7 | 2 | 2.88 | 0.2 | 7.0 |
| Q | MICROSOFT CORP | 79 | 37 | 56.25 | -1.4 | -2.4 |
| Q | MORINO ASSOCIATES INC | 20 | 7 | 16 | -0.5 | -3.0 |
| Q | NATIONAL DATA CORP | 34 | 20 | 24.25 | -0.4 | -1.5 |
| Q | ON LINE SOFTWARE INTL INC | 22 | 5 | 5.63 | -0.3 | -4.3 |
| Q | ORACLE SYS CORP | 22 | 8 | 20.00 | 2.0 | 11.1 |
| N | PANSOPHIC SYS INC | 28 | 11 | 15.50 | 0.4 | 2.5 |
| Q | POLICY MGMT SYS CORP | 30 | 15 | 23.25 | 0.3 | 1.1 |
| Q | PROGRAMMING & SYS INC | 14 | 7 | 12.88 | 0.1 | 1.0 |
| Q | REYNOLDS & REYNOLDS CO | 38 | 14 | 19.38 | 0.4 | 2.0 |
| Q | SEI CORP | 22 | 10 | 19.00 | 0.8 | 4.1 |
| Q | SHARED MED SYS CORP | 30 | 17 | 18.13 | 0.0 | 0.0 |
| Q | SAGE SOFTWARE INC | 14 | 5 | 6.63 | 0.4 | 6.0 |
| Q | SOFTWARE PUBG CORP | 25 | 5 | 23.38 | 2.5 | 12.0 |
| A | STERLING SOFTWARE INC | 11 | 6 | 6.63 | 0.1 | 1.9 |
| Q | SUNGARD DATA SYS INC | 20 | 10 | 19.13 | 0.4 | 2.0 |
| Q | SYSTEMATICS INC | 34 | 19 | 30.75 | -0.8 | -2.4 |
| N | SYS. SOFT INC | 24 | 7 | 18 | 0.8 | 4.4 |
| Q | VM SOFTWARE INC | 21 | 7 | 16.25 | 0.8 | 4.8 |

## Semiconductors

| EXCH | | 52-WEEK RANGE (1) | | PRICE CLOSE AUG. 8 1988 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|---|
| N | ADV MICRO DEVICES INC | 25 | 8 | 13.50 | 0.6 | 4.9 |
| N | ANALOG DEVICES INC | 24 | 8 | 13.75 | 0.0 | 0.0 |
| Q | ANALOGIC CORP | 13 | 5 | 7.50 | 0.3 | 3.4 |
| Q | INTEL CORP | 42 | 18 | 34.75 | 1.0 | 3.0 |
| Q | LSI LOGIC CORP | 15 | 7 | 13.25 | 0.5 | 3.9 |
| Q | MONOLITHIC MEMORIES INC | 30 | 8 | 15 | 0.0 | 0.0 |
| N | MOTOROLA INC | 74 | 35 | 47.25 | 2.0 | 4.4 |
| N | NATL SEMICONDUCTOR | 22 | 10 | 10.88 | 0.4 | 3.6 |
| N | TEXAS INSTRS INC | 80 | 36 | 42.88 | 1.3 | 3.0 |
| A | WESTERN DIGITAL CORP | 30 | 11 | 14.63 | 1.5 | 11.4 |

## Peripherals

| EXCH | | 52-WEEK RANGE (1) | | PRICE CLOSE AUG. 8 1988 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|---|
| Q | ALLOY COMP. | 13 | 2 | 2.00 | -0.5 | -20.0 |
| N | AM INTL INC | 9 | 3 | 6.13 | 0.5 | 8.9 |
| Q | AST RESH INC | 21 | 6 | 16.13 | 0.4 | 2.4 |
| Q | AUTO TROL TECH CORP | 7 | 3 | 5.13 | 0.3 | 5.1 |
| Q | BANCTEC INC | 14 | 5 | 9.25 | 0.5 | 5.7 |
| Q | CIPHER DATA PRODS INC | 12 | 4 | 9.50 | 0.8 | 8.6 |
| A | COGNITRONICS CORP | 5 | 2 | 3.25 | -0.1 | -3.7 |
| N | COMPUGRAPHIC CORP | 28 | 19 | 26.88 | 0.0 | 0.0 |
| A | DATAPRODUCTS CORP | 24 | 7 | 11.38 | -0.4 | -3.2 |
| A | DATARAM CORP | 8 | 5 | 7.63 | 0.3 | 3.4 |
| N | EASTMAN KODAK CO | 71 | 39 | 45.38 | 2.1 | 4.9 |
| Q | E M C CORP MASS | 29 | 5 | 5.38 | -0.5 | -8.5 |
| Q | EMULEX CORP | 9 | 4 | 7.25 | 0.0 | 0.0 |
| Q | EVANS & SUTHERLAND | 35 | 14 | 16.25 | -0.3 | -1.5 |
| Q | ICOT CORP | 8 | 3 | 3.38 | -0.3 | -6.9 |
| Q | INTERLEAF INC | 24 | 10 | 11.50 | 0.9 | 8.2 |
| Q | IOMEGA CORP | 5 | 1 | 3.69 | 0.4 | 11.3 |
| Q | LEE DATA CORP | 6 | 3 | 3.44 | -0.1 | -1.8 |
| Q | MASSTOR SYS CORP | 5 | 1 | 2.56 | 0.4 | 17.1 |
| Q | MAXTOR CORP | 16 | 6 | 8.25 | 0.1 | 1.5 |
| Q | MICROPOLIS CORP | 39 | 13 | 13.13 | -0.4 | -2.8 |
| Q | MINISCRIBE CORP | 17 | 5 | 12.00 | 0.0 | 0.0 |
| N | MINNESOTA MNG & MFG CO | 84 | 45 | 64.38 | 2.4 | 3.8 |
| A | MSI DATA CORP | 19 | 8 | 10.25 | 0.5 | 5.1 |
| Q | PERSONAL COMPUTER PRODUCTS INC | 7 | 4 | 5.25 | 0.1 | 2.4 |
| Q | PRIAM CORP | 4 | 1 | 1.63 | 0.0 | 0.0 |
| Q | PRINTRONIX INC | 12 | 7 | 9.75 | -0.3 | -2.5 |
| N | QMS INC | 27 | 7 | 7.50 | 0.0 | 0.0 |
| Q | QUANTUM CORP | 19 | 8 | 10.75 | 0.5 | 4.9 |
| Q | RAMTEK CORP | 6 | 1 | 0.56 | 0.0 | 0.0 |
| N | RECOGNITION EQUIP INC | 21 | 6 | 8.25 | 0.3 | 3.1 |
| Q | REXON INC | 11 | 4 | 6.38 | 0.3 | 4.1 |
| Q | SCAN TRON CORP | 17 | 7 | 15.50 | 0.0 | 0.0 |
| Q | SEAGATE TECHNOLOGY | 32 | 10 | 10.38 | -1.5 | -12.6 |
| N | STORAGE TECH CORP | 4 | 1 | 2.38 | -0.3 | -9.5 |
| Q | TANDON CORP | 5 | 1 | 2.25 | 0.0 | 0.0 |
| A | TEC INC | 6 | 3 | 2.88 | -0.3 | -8.0 |
| N | TEKTRONIX INC | 41 | 21 | 22.63 | 0.4 | 1.7 |
| Q | TELEVIDEO SYS INC | 3 | 1 | 1.03 | 0.0 | -3.0 |
| N | TELEX CORP | 73 | 30 | 49.00 | 0.0 | 0.0 |
| Q | WYSE TECH | NA | NA | 21.00 | 0.0 | 0.0 |
| N | XEROX CORP | B5 | 50 | 53.38 | 1.3 | 2.4 |
| Q | XIDEX CORP | 15 | 5 | 8.88 | 0.0 | 0.0 |

## Leasing Companies

| EXCH | | 52-WEEK RANGE (1) | | PRICE CLOSE AUG. 8 1988 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|---|
| N | CAPITAL ASSOCIATES INTERNATIONAL INC | 10 | 4 | 6.00 | 0.0 | 0.0 |
| N | COMDISCO INC | 37 | 12 | 21.38 | -0.4 | -1.7 |
| Q | CONTINENTAL INFO SYS | 12 | 4 | 3.75 | -0.4 | -9.1 |
| Q | PHOENIX AMERN INC | 5 | 2 | 2.75 | 0.0 | 0.0 |
| Q | SELECTERM INC | 6 | 3 | 4.88 | 0.0 | 0.0 |

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL;
O = OVER-THE-COUNTER; S = SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

# To and fro

### *Early gains fade away as summer doldrums hit market*

The lazy hazy days of August wove their spell on Wall Street last week as computer issues seesawed and the Dow Jones industrial average wandered up, then headed back down late in the week to erase earlier gains. Microsoft Corp. was among the hardest hit, its issues sinking after analysts expressed concern that the software giant's profit level will continue to shrivel. Microsoft stock finished Thursday's close at 55½, down four points from a week earlier.

In other action for the four days of trading, Digital Equipment Corp. fell 2⅝ points to 103½; Amdahl Corp. dropped 2⅛ points to 47⅜ despite stepping up its price war with IBM with the announcement of price cuts on its mainframes; IBM slipped 1½ points to 124¼; NCR Corp. was off one point to 58¼; and Hewlett-Packard Co. fell one point to 58¼. Gainers included Sun Microsystems, Inc., which rose 1⅞ points to 38½ after releasing a soaring earnings report; 3Com Corp., up 1¼ points to 18⅝; Lotus Development Corp., up ¾ of a point to 21¾; Novell, Inc., up ¾ of a point to 26¾; Control Data Corp., up ¾ of a point to 23½; and Ashton-Tate Corp., up ½ a point to 23¾.

JAMES DALY

# Hackers

FROM PAGE 1

available for not conducting an investigation. "High ranking [U.S. Department of Justice] officers said that it was probably just a kid, and there would be no prosecution even if we did find him," he said.

The Justice Department and the Federal Bureau of Investigation would not comment on the case.

"I wrote an autopsy of the case," Christy said. "I call it an autopsy because the victim died and the murderer got his gun back."

Computer security experts and computer law specialists say that the laws involving theft of data or simply breaking into a system and browsing data need to be more clearly defined.

## More than law

But they all agree that it is not just an issue of law. In fact, Christy listed a dozen laws that the agencies knew were being violated. "The best laws in the world are not going to do any good. It is not a legal problem," said Peter Neumann, a computer security consultant at SRI International in Menlo Park, Calif.

"You need laws, ethics, values, a society that cares and better computer systems," Neumann said.

"This person was targeting military organizations and looking for key words you'd associate with someone doing espionage. Here was somebody whose interests were not [limited to] playing games," Stoll said.

Stoll and dozens of volunteers monitored Hess' attempts to enter about 450 sensitive computers, using computer network connections at Lawrence Berkeley Laboratory — primarily Advanced Research Projects Agency Network, Milnet and Internet. According to Stoll, Hess "successfully" broke into more than 30 of those, mostly military and military research facilities.

"He got into [one-third] of those systems as a system manager," Stoll said. As a system manager, Hess could read, write, erase or modify any of the files on the system. Instead of altering information, he printed out as much information as he could into his home system.

**Lawrence Berkeley's Stoll**

Stoll said Hess used well-known bugs, like one in the Free Software Foundation's Gnu-Emacs text editor that allows a user to change file ownership and move files. Through this hole, Stoll said, the intruder was able to masquerade as a utility periodically run by the system.

Stoll traced the hacker's calls through a convoluted web of telephone lines and packet-switched networks, finally succeeding in planting a sensor that would alert him when the invader logged on to a target system.

Stoll then baited a trap by creating fake directories he thought Hess would take time to peruse, one of which he named "SDI Network." Hess "spent two hours copying this information into his home computer. In two hours, we were able to finish the trace, and we were able to determine precisely who he was," Stoll said.

Christy said communications between the agencies — which by this time also included the U.S Department of Energy, Lawrence Berkeley Laboratory's funding agency; the National Computer Security Center; and all countries involved in the trace — "was a nightmare. We didn't deal with it real well," he said.

"The agencies are very parochial; they wouldn't share information with each other," he added.

The U.S. enforcement agencies turned the case over to West German authorities, who, Christy said, never informed U.S. officials why they seized Hess' equipment and subsequently returned it. "The [West] German defense attorney kept the government from looking at the evidence which was seized. No one knows why," Christy said. As far as U.S. authorities know, the case was terminated in April.

## A lesson learned

"Hopefully, we learned from this," Christy said. "We put together a network of people in the FBI who are interested in it, but they're not in high places. Other agencies, like the Department of Justice, are just starting to understand."

While such an enforcement network would be helpful, the law is still vague because it insists that "intent to defraud" the government be proved.

Another reason that laws and enforcement agencies cannot be depended on is the nature of hacking itself. "There are lots of patterns where people come in and do something nasty and get right out again," Neumann said. "You'd have a hell of a time getting warrants and subpoenas."

Until laws, enforcement and social policy catch up with the computer age, Stoll and others suggest those involved in information systems beware of security holes and train employees to be aware of their role in making the systems secure.

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# Dbase IV watchers: Schedule looks tough

BY STEPHEN JONES
CW STAFF

TORRANCE, Calif. — Ashton-Tate Corp. is feverishly updating its Dbase IV beta code, often on a daily basis, but some users of early versions of the critical product said Dbase IV has little chance of meeting its already-delayed September release date.

Ashton-Tate said it has developed a total of 255 in-house versions of Dbase IV, hammering out bugs and trying to whittle down code to reduce memory requirements.

A company spokesman claimed that the latest beta version, called 2.55, is the first fully functional example of Dbase IV, with smooth integration across all components of the program. He maintained that the application will ship by the Sept. 30 deadline. The company promised attendees of a developers' conference it is sponsoring in early September that they will receive Dbase IV beta code.

However, analysts and others who have seen recent releases of the product reported system crashes and a rough implementation of all-important SQL capabilities. One user said Ashton-Tate's drive to squeeze the bulky program into 640K bytes of memory has resulted in features such as user-defined functions being scrapped in updates.

"I don't know if anyone has seen a stable version of Dbase IV yet; it's almost certain that it's going to be late," said Richard Finkelstein, president of Performance Computing, Inc. in Chicago.

"Late" is a word Ashton-Tate would like to purge from its corporate lexicon. Dbase IV has already missed a July ship date, and further delays could hurt its relationship with upgrade-hungry users and a skeptical Wall Street.

One database expert claimed that Dbase IV is being slowed because Ashton-Tate developers will not leave well enough alone. Ashton-Tate seems to be spending too much time on the finer points of implementing features such as interactive editing and browsing of files, said David Kalman, editor-in-chief of *Data Based Adviser*, a database magazine in San Diego.

## Test and test again

"Every time they decide to do something new, they extend the testing cycle and as a result, they extend the shipping date," Kalman said. Kalman, who put Dbase IV beta code through a regimen of tests, noted that a delayed ship date is less troubling than releasing a problematic application.

Adam Green, a Dbase author and lecturer, said Ashton-Tate will have to ship some form of Dbase IV by the end of next month to get the product in customers' hands after two years without a Dbase upgrade.

"Whether it's prerelease beta ware of a strong functional version, they're going to release something," Green said. "They've put a lot of pressure on themselves to get it out the door."

Green said he is using beta Version 2.13 because later releases are missing important pieces, such as memo fields and user-defined functions, because of memory restraints. Green said that although his students like the new features of Dbase IV, they are disappointed with its speed and performance.

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# Apple-DEC

FROM PAGE 1

to address user complaints about incompatible implementations, superficial access and less-than-smooth connectivity. Users have been asking Apple to take the lead in these areas.

## Optimistic outlook

Although the DEC/Apple alliance has been greeted skeptically by the industry, Roy Davis, an operations manager at Hughes Aircraft Co., in Long Beach, Calif., said he is optimistic. "I think it's very important to a company like ours that Apple and DEC cooperate and provide the basic infrastructure in a useful way. The sooner they get it together, the better for the industry," Davis said.

Davis' installation includes about 7,000 Macintoshes and hundreds of VAXs.

Davis said he is particularly interested in the ability to move graphics and text between systems as well as being able to manage all his Appletalk networks from one centrally located VAX.

In the announcement this week, analysts said the companies will present the following:

- Appletalk for VMS, which will provide Mac programmers with a Mac interface to VAX communications without having to learn DEC system peculiarities. Companies using the Macintosh as a VAX front end have previously had to develop their own programs to facilitate that configuration.
- Specifications that will allow Appletalk File Protocol (AFP)-based applications to utilize a VAX system as a network server.

"This implementation of AFP Server on a VAX VMS system allows the user to make use of larger VAX disk resources," the vendors claimed in a program summary distributed to analysts. They also said the AFP Server will support VMS security mechanisms and provide a growth path from a Mac-based server to a VMS-based server.

- VT terminal (Models 100-300) emulation, which will give Appletalk-based Macintoshes access to VAX-based terminal services and the ability to use DEC Windows, the mini-maker's implementation of the X Windows graphical environment.

This would support simultaneous access to several VAX-based applications from one Macintosh station.

- Distributed database access via an internally developed DEC SQL service and a Network Innovations Corp. CL/1-based SQL product from Apple. The CL/1 Connectivity Language Description will be released today. These products will provide Mac users with access to distributed network applications such as queries to data stored on VAX-based databases.

"These two companies are taking the same layered approach that IBM is taking with SQL — a database manager under OS/2, SQL Distributed Services under [IBM's Application System/400] and 9370 and DB2 on the mainframe," another analyst said.

- Enhancements to DEC's Distributed Document Interchange Format will support document interchange between Appletalk and Decnet.

Apple will provide file exchange translators to key Mac file formats, and DEC will provide VAX-based conversion tools for VAX document formats.

- A gateway between Appletalk and Decnet, supporting the first four layers of the Open Systems Interconnect model. DEC will develop the actual gateway, providing protocol specifications, while Apple will develop the access routines and publish a Mac API so that development work can be done under the Mac interface.

Also, Apple and DEC have committed to providing network management that would enable systems administrators on both networks to look into each environment and isolate faults.

# 386I shipments stalled

*Sun clouded by DRAM chip shortage*

BY JULIE PITTA
CW STAFF

MOUNTAIN VIEW, Calif. — More than three months after its introduction, Sun Microsystems, Inc.'s workstation targeted at bridging the MS-DOS and Unix worlds has yet to ship in volume to end users.

> "YOU HAVE TO think of this product as a workstation rather than a PC."
>
> BRAD SMITH
> DATAQUEST

The 386I, which can run Microsoft Corp. MS-DOS sessions under Unix by using a Phoenix Technologies Ltd. software coprocessor, has been hampered by a shortage of components. The scarcity of dynamic random-access memory chips has slowed shipments, according to sources close to the company.

Most shipments of 386I workstations have gone to OEMs and third-party software developers, few of which are from the MS-DOS world. Sun officials said they are working to get the system to end users for beta testing.

The 386I represents the first time Sun has introduced an Intel Corp.-based system and its first workstation able to run MS-DOS. Sun officials said they hope the system will allow the company to branch out from technical environments, which have been the basis for its success in commercial markets that have traditionally standardized on DOS.

One user who has managed to obtain 10 386I workstations said he is pleased with the systems' performance during testing. "They're very fast," said Leo Hoarty, vice-president of capital market systems at Paine Webber, Inc. "They run DOS, as well as Unix, very nicely."

Hoarty said he hopes to create a network of 386I workstations — using Sun's Motorola, Inc.-based system as a file server — for traders.

"Sun is not all roses," Hoarty said. "They are seriously lacking in window tool kits."

Brad Smith, an industry analyst at Dataquest, Inc., said the 386I will find a niche with workstation users who now jump between Unix and DOS systems. "You have to think of this product as a workstation rather than a PC," he said. "There's hardly a workstation user that doesn't use both DOS and Unix."

## Basking in that billion-dollar glow

un topped the $1 billion annual revenue mark as its explosive growth continued in fiscal 1988.

The celebration at the Silicon Valley workstation vendor stands in stark contrast to the grim mood at its East Coast competitor, Apollo Computer, Inc. One month ago, Apollo announced that it anticipates a loss of between $5 million and $8 million for its fiscal quarter ended July 2. Apollo's stock plunged, the firm was hit with a class-action lawsuit, and its president and chief operating officer, Roland D. Pampel, resigned.

Sun overcame a much-publicized shortage of memory components to become a billion-dollar baby. Analysts had feared that the company would be unable to ship workstations because of the scarcity of dynamic random-access memory (DRAM) parts.

For the fiscal year ended June 30, Sun posted net income of $66.4 million, or $1.79 per share, on revenue of $1.05 billion. In comparison, the company reported net income of $36.3 million, or $1.11 per share, on revenue of $537.5 million for fiscal 1987.

Sun's results in fiscal '88 represent a 96% increase in revenue and an 83% increase in profits over the prior year.

Despite these stellar results, Sun officials said they felt the impact of the DRAM shortage. "We probably could have done $100 million more in fiscal '88 if we could have gotten all the DRAM parts we needed," said Austin Meyer, the firm's director of investor relations.

Sun officials warned that growth will slow when compared with the levels achieved during the record-breaking fourth quarter. Revenue levels increased by $100 million from the third to fourth quarters of fiscal 1988 as Sun made a "concerted effort" to reduce an "unusually large" backlog, officials added. Despite this effort to push more workstations out the door, Sun's backlog during the fourth quarter was about $224 million, the highest for any quarter in its history.

JULIE PITTA

# Micro Channel

FROM PAGE 1

Channel compatible, has now said it may hold off delivery of that product until next year.

"We have been experiencing little to no demand for the Micro Channel," Dell spokesman John Ellett said. He added that demand for AT-style computers is still very strong.

Tandy Corp. has made the Micro Channel plunge and is currently shipping its Tandy 5000 MC in small quantities, according to Ed Juge, director of market planning. "There is some demand" for the compatible, Juge said, but nothing like that for AT-style bus products. Most of the 5000 MC sales are going to companies that believe they will need it within the next two years and to Tandy competitors, Juge said.

**Non-MCA dominates**

Framingham, Mass., market research firm International Data Corp. (IDC) has predicted that 1.4 million MCA-based PS/2s will ship this year but that vendors of PC compatibles will ship 5.5 million non-MCA units.

For Dennis Yellina, a systems analyst at Colgate Palmolive Co. in Jeffersonville, Ind., the Micro Channel is not a priority. The company is still buying predominantly AT-class machines.

Greg Cline, a senior analyst at The Yankee Group in Boston, said that for most users, the advantages of the Micro Channel are simply not clear-cut yet.

At the Providence Journal Co. in Providence, R.I., systems engineer Peter Scheidler said his company's stance is typically to stick with IBM and that it is buying mostly PS/2s.

"The joy of buying IBM is that the stuff is well put together," he said, "but you're buying in to the future of the Micro Channel, which may or may not have a future."

Robert Metz, a senior technical analyst at Whirlpool Corp. in Benton Harbor, Mich., said that while his firm is buying some PS/2s, "we always caution that this is not a compatible machine." The company also buys AT-class machines from Zenith Data Systems.

Surprisingly, in Europe, where IBM is not as dominant a force as in the U.S., the PS/2s are doing quite well.

According to preliminary estimates from IDC Europa Ltd. in London, IBM increased its total personal computer sales in Europe last year by 38% to 566,000 units. Of those, half were PS/2s; half of those were non-MCA-based Model 30s.

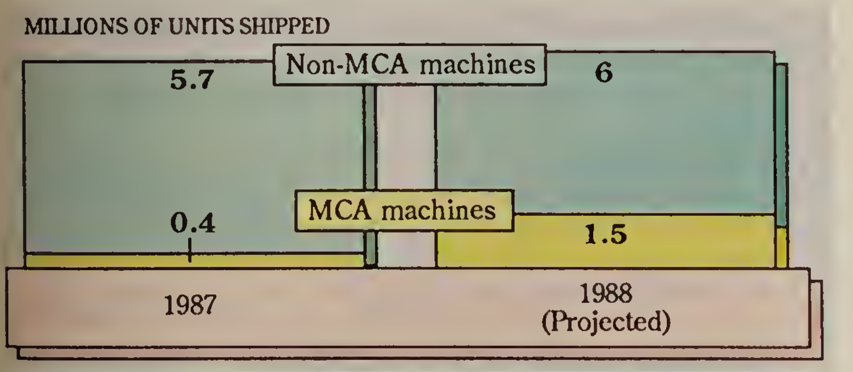
For 1988, according to IDC Europa, the Model 30 continues to sell well in Europe, but Model 50 sales have slipped.

"In large accounts in most countries, the PS/2 will be bought as an extension of existing computerization plans," said Gordon Curran, senior consultant at Intelligent Electronics SA, a Dataquest, Inc. affiliate in Paris.

*Amiel Kornel, Paris bureau chief of the IDG News Serivce, contributed to this report.*

## Close but no cigar

*Micro Channel Architecture machines are expected to remain a small portion of total IBM and compatible micros shipped*



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

## CORRECTIONS

National Advanced Systems' planned Unix operating system [CW, July 11] is expected to be available in the fall of 1989.

The June 6 Spotlight chart on CASE products should have identified Inspector from Language Technology, Inc. as an IBM mainframe product that uses McCabe's Metrics and addresses the maintenance phase of the software life cycle for Cobol 68, Cobol 74, Cobol II and IBM's IMS code through the production of annotated listing and portfolio scatter graphs.

In "IBM claims Netview no CPU hog" [CW, July 18], it took a host running Netview Release 2 approximately 2,000 CPU seconds to process 30,000 logical unit sessions: 1,600 seconds to process logon sessions and 4,300 seconds to process session awareness data.

In an article titled "Counting the ways CASE helps," which appeared in the June 6 Spotlight section, Hercules, Inc. in Wilmington, Del., was incorrectly identified as Hercules Computer Technology, Inc.

Unisys is one of the seven founding members of the OSI/Network Management Forum [CW, Aug. 1].

In a June 20 Spotlight chart, the price for Information Technologies, Inc.'s Linkup 3270 Coax 10-Net Gatestation should have read $1,395.

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## TRENDS

# Third-generation languages

One of the more graphic characteristics about the use of computer technology is the widely varying use of languages relative to size and brand of hardware platform, according to figures compiled by Computer Intelligence.

In many cases, the predominating language on a certain class of machines reflects the community in which a line of machines first became well established. For instance, Cobol predominates at 81% of IBM mainframe sites, reflecting its usefulness as a general-purpose business language and the mainframe's dominance as a general-purpose business processor.

In contrast, Cobol is used at only 14% of Digital Equipment Corp. VAX sites. The VAX and its predecessor, the PDP series, got their start in the scientific and engineering community, in which the language of choice has always been Fortran.

In a similar vein, IBM's mid-range machines have always been popular with the small-business community and frequently function as the central processor for a quasi-independent unit of a larger corporation. With limited MIS staffs, these organizations overwhelmingly prefer the easy-to-learn RPG-II and III languages, according to Computer Intelligence.

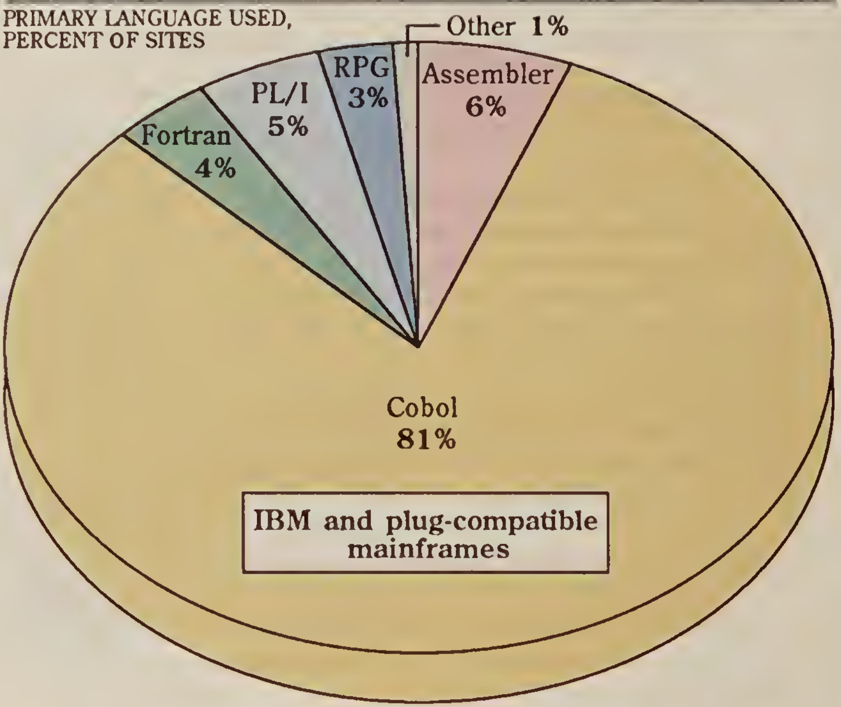
As a result, RPG-II and III are the primary languages at 92% of IBM System/34, 36 and 38 sites. These machines show the narrowest range of language use. Cobol, which might be used for more complicated business applications at these sites, is the runner-up, being the primary language at only 7% of the sites.

The VAX shows the widest range of language use. The C language, for example, is little used on the mainframe. IBM does not offer a C compiler yet for the mainframe, although third-party suppliers do. But C trails behind Fortran and Cobol on the VAX, predominating at 13% of the sites.

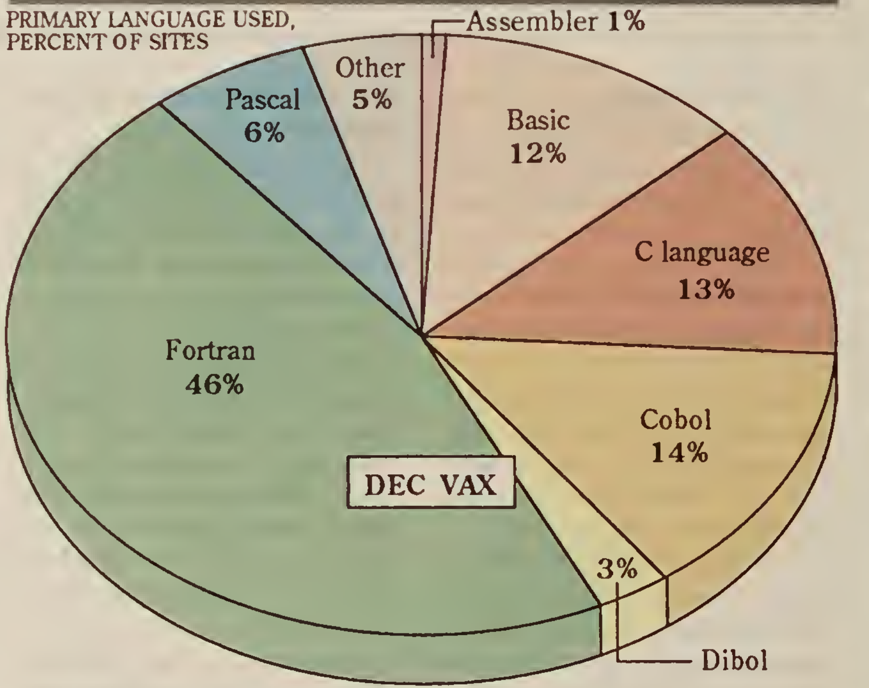
DEC's proprietary language, Dibol, a Cobol look-alike, has enjoyed slender success on VAXs, similar to IBM's proprietary language, PL/I. Dibol is the primary language at only 3% of VAX sites, and PL/I is used at 5% of mainframe sites. These differences could be further enhanced when considering personal computer languages. Basic, C and Pascal would play larger roles on that platform than on other machines.

CHARLES BABCOCK

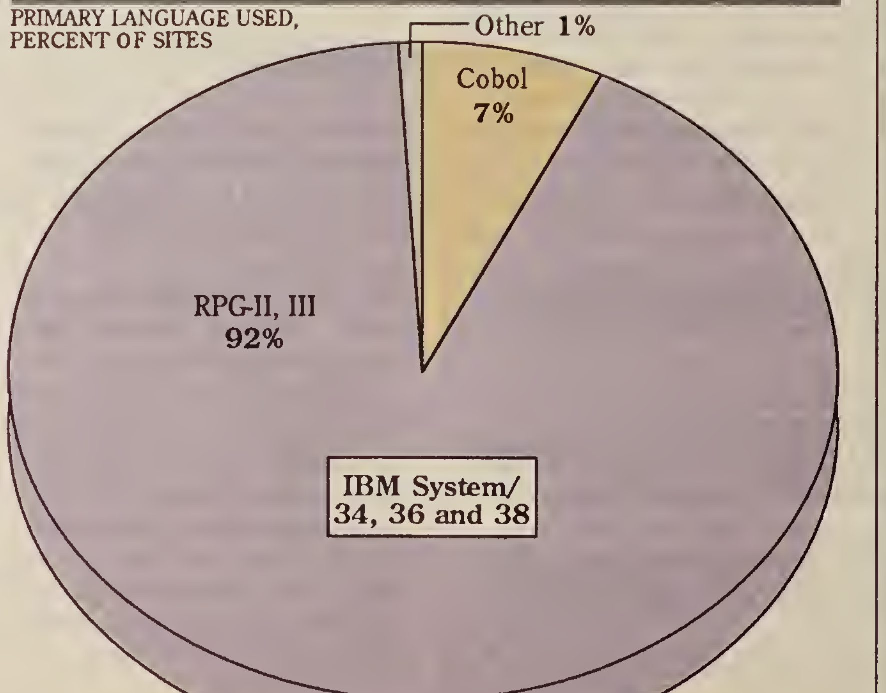
**Cobol still king at mainframe sites**



**Fortran remains VAX favorite**



**RPG's hold on IBM mid-range undaunted**



## INSIDE LINES

**It works great, mostly.** Like most major operating system upgrades, IBM's PC-DOS 4.0 has compatibility problems with some programs. IBM says the vast majority of programs run well but that "a limited number" are currently incompatible. The company says it is working with vendors of those products to correct the situation as quickly as possible.

**Give us your discards, but keep the Micro Channel.** Compaq recruiters made a pilgrimage to Boca Raton, Fla., last week to seek out professional types to fill engineering, marketing, sales and manufacturing positions. A spokeswoman said that at a similar event in Dallas in June, the recruiters talked to more than 1,200 people; Compaq was hoping for a similar turnout in Boca Raton. Compaq's selection of Boca wasn't entirely because of the panoramic ocean views: IBM recently announced it will be closing its Boca Raton manufacturing facility and eliminating some 1,600 jobs there.

**Throw out those mainframe applications.** IBM has neglected to provide the first version of its Communications Manager for OS/2 Extended Edition with support for High-Level Language Application Programming Interface, "which is the only industry standard for accessing existing 370 applications via the 3270 data stream," says Fred Barrett, president of F. J. Barrett and Associates. This has angered the many terminal emulation vendors and customers who have based their micro-to-mainframe links on the protocol.

**Monitoring the Decstream.** DEC is everywhere these days, doing its level best to branch out. There is some speculation that the firm will emulate its Apple love-in down in Texas with Compaq; several months ago, DEC announced an agreement to support Compaq equipment. Also, DEC is reportedly seriously mulling over an investment in Digital Communications Associates in hopes of providing customers with better IBM host connectivity. And the rumored buy-out of Mips Computer Systems persists, with talk that a deal is just about done.

**Down on the fat farm.** Lotus continues to steam the pounds off 1-2-3 Release 3.0 to squeeze it into the cramped confines of DOS. But sources say it is still fat, taking up some 3M bytes of RAM under OS/2. The product is not yet small enough for MS-DOS, but that will change when Lotus implements an overlay scheme — putting the most frequently used functions into the main component and leaving the rest to overlays. Despite rumors that Lotus will release an OS/2 version first and then move to DOS when the size is right, the overlays should do the trick — and, our source says, let both OS/2 and DOS iterations ship by year's end.

**Transaction reaction.** The five-vendor "critical mass" that Omri Serlin, president of Los Altos, Calif.-based consulting firm Itom International, said in mid-July would be required to launch a vendor-neutral, independent asssociation to standardize and apply the Debit/Credit transaction benchmark has been met. The Transaction Processing Performance Council, which boasts eight charter members — including DEC and Tandem — and has other companies already voicing interest, will be formally announced this week. Its purpose: to monitor the often-claimed (and always questioned) measure of on-line transaction processing performance.

*It would be easy to read much into the quiet price hikes for 3090 service and upgrades, which were not released to media and analysts and were followed two days later by an announcement of price hikes specifically excluding 3090s. We were handed a simpler explanation: Different groups at IBM prepare the official announcements, known as "ivories," and in this case the group responsible for product ivories was asked by IBM public relations to provide them for the general announcement, while the group responsible for pricing ivories was unintentionally overlooked. If you know better, contact the hot line at 800-343-6474 or 508-879-0700 and point News Editor Pete Bartolik in the right direction.*

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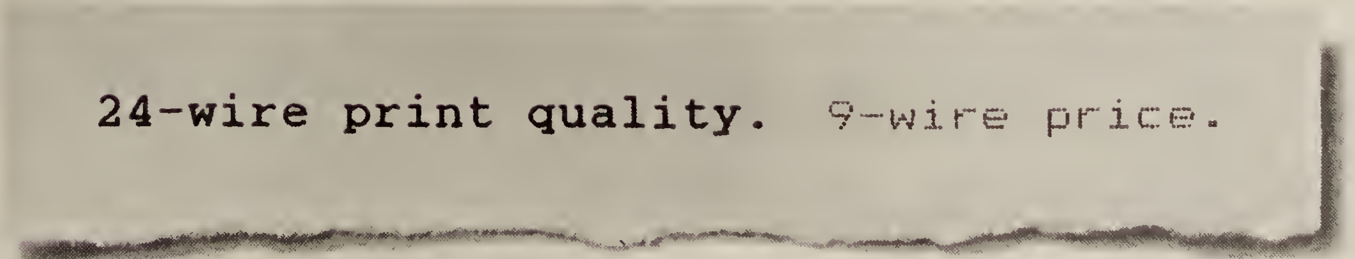

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The P2200's 24-wire print head produces crisp, fully-formed characters for a 9-wire price. Which means you get print quality that people will stop and read. At a price that won't stop you.

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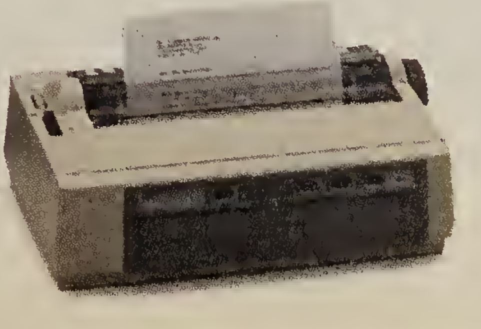

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